

5. Before cleaning with acid, determine if any hazardous reaction products could form. For example, a sensor used in a cyanide bath should not be put directly into a strong acid for cleaning because poisonous cyanide gas could be produced. Acids are hazardous and appropriate eye protection and clothing should be worn in accordance with Material Safety Data Sheet recommendations.

Muriatic or other dilute acids may be used to clean the sensor. The acid should be as dilute as possible, but yet strong enough to clean. Experience will help determine which acid to use and how dilute it can be. Some stubborn coatings may require a different cleaning agent. Contact the factory for assistance in these difficult cases.

Soak the sensor in dilute acid for no more than 5 minutes. Rinse the sensor with clean, warm water and then place the sensor back into the mild soap solution for 2 to 3 minutes to neutralize the acid.

6. Rinse the sensor in clean, warm water.
7. Calibrate the sensor and instrument with pH buffers (refer to instrument instruction manual). If calibration cannot be accomplished, replace the sensor's standard cell buffer and salt bridge (Part Four, Section 2). If calibration is still not possible, troubleshoot the sensor in accordance with Part Four, Section 3.

SPECIAL CASE

Sensors which have an antimony (instead of glass) process electrode that still cannot be calibrated after normal cleaning and replacement of the standard cell buffer and salt bridge may require additional electrode cleaning. The antimony electrode is brittle and can easily break. Use care when cleaning it. **Very carefully** file the tip of the antimony electrode and lightly scrape its rounded sides to remove any process coating.

WARNING: ANTIMONY IS TOXIC! CAREFULLY DISPOSE ALL FILINGS IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS. WHEN FINISHED, WASH HANDS THOROUGHLY.

SECTION 2 - REPLACING STANDARD CELL BUFFER/SALT BRIDGE

The sensor's standard cell buffer and salt bridge should be replaced if calibration cannot be accomplished after cleaning the sensor. To do so:

1. Hold sensor in upright position and remove the salt bridge (Figure 4-1) by turning it counterclockwise with pliers to initially loosen it. Take care not to damage the protruding process electrode. Discard the old salt bridge.
2. Replace the standard cell buffer in the chamber of the standard cell. The buffer may be a solution or a gel.
 - A. For Solution-Filled Chamber:
 - a. Pour out the aged standard cell buffer. Thoroughly flush standard electrode chamber with distilled water.
 - b. Fill standard electrode chamber with fresh standard cell buffer (GLI p/n 25M1A1001-115).
 - B. For Gel-Filled Chamber:
 - a. Remove aged standard cell buffer gel using a jet of water from a "water pik" type device. Thoroughly flush standard electrode chamber with distilled water after removing the gel.
 - b. Place one level bottle cap (1/8 level teaspoon) of gel powder (GLI p/n 25M8A1002-101) into chamber. Then add fresh standard cell buffer (GLI p/n 25M1A1001-115). Mix together until a gel consistency is attained. Continue this procedure until level of gel is sufficient to contact the salt bridge

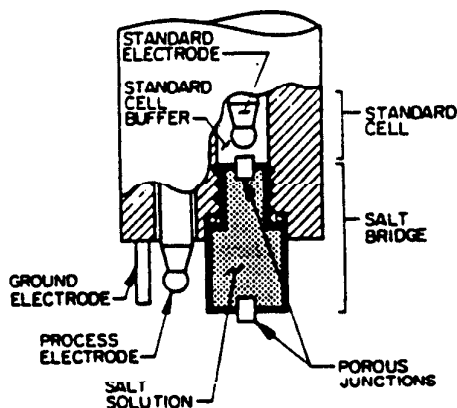


FIGURE 4-1 Sensor Electrode Details

when it is installed. To check for proper level, replace and remove the salt bridge. A formed impression of the salt bridge should appear in the gel surface.

3. Install the new salt bridge (see Part Five for part number). Inspect O-ring for imperfections and replace if necessary. Turn salt bridge clockwise until finger tight. Then tighten with pliers (approximately 1/4 turn). Do not overtighten!

SECTION 3 - TROUBLESHOOTING

A few simple measurements can determine if the sensor is operating properly. A multimeter and two pH buffer solutions (pH 7 and pH 4 or 10) are required.

Clean the sensor in accordance with Part Four, Section 1. If the instrument and sensor cannot be calibrated, replace the standard cell buffer and salt bridge as described in Part Four, Section 2. If the measuring system still cannot be calibrated after replacing the standard cell buffer and salt bridge, perform the appropriate test in this section (3.1 or 3.2) that applies to your sensor type.

3.1 Sensors With 5-Wire Cable (Integral Preamplifier)

1. Disconnect sensor's red, green, yellow and black wires from the instrument (at junction box, if used) and place sensor in pH 7 buffer. Before performing steps 2 through 5, allow temperature of sensor and buffer solution to equalize at approximately 25°C (room temperature).
2. To verify that the sensor's temperature compensator is operating properly, measure the resistance between the yellow and black wires. The reading should be between 250 and 350 ohms at approximately 25°C.
3. Reconnect the yellow and black wires.
4. Place multimeter (+) lead on red wire and (-) lead on green wire. Measure the DC millivolts with the sensor in pH 7 buffer. This reading is called "offset" and it should be between (-)50 and (+)50 mV. If it is, the sensor "offset" is within factory-specified limits. Note the millivolt value and perform step 5. If not, discontinue this test and refer to GLL's warranty/replacement plan on page 2 for details on sensor replacement.
5. Check the sensor "span" by measuring the millivolts with the sensor in either pH 4 or pH 10 buffer. Keep the millivolt meter connected as described in step 4.

3.2 Sensors With 2-Wire Cable (Integral Two-Wire Transmitter)

A. Span Check In pH 4 Buffer

Rinse sensor with water and place in pH 4 buffer. The "span" reading should be at least (+)160 mV more than the noted "offset" reading in step 4. Examples of typical readings are:

<u>"Offset" Reading</u> <u>In pH 7 Buffer</u>	<u>"Span" Reading</u> <u>In pH 4 Buffer</u>
(-)50 mV	(+)110 mV
(-)25 mV	(+)135 mV
0 mV	(+)160 mV
(+)25 mV	(+)185 mV
(+)50 mV	(+)210 mV

B. Span Check In pH 10 Buffer

Rinse sensor with water and place in pH 10 buffer. The "span" reading should be at least (-)160 mV less than the noted "offset" reading in step 4. Examples of typical readings are:

<u>"Offset" Reading</u> <u>In pH 7 Buffer</u>	<u>"Span" Reading</u> <u>In pH 10 Buffer</u>
(-)50 mV	(-)210 mV
(-)25 mV	(-)185 mV
0 mV	(-)160 mV
(+)25 mV	(-)135 mV
(+)50 mV	(-)110 mV

If the "span" reading complies with A or B of this step, the sensor is within factory-specified limits. If not, refer to GLI's warranty/replacement plan on page 2 for details on sensor replacement.

1. Connect a DC milliammeter in series with the sensor and instrument (or +24 VDC source):
 - A. Disconnect sensor's red (+) wire from instrument and connect it to milliammeter (+) input.
 - B. Connect milliammeter (-) input to instrument's (+) input terminal.
2. Place sensor in pH 7 buffer. Allow temperature of sensor and buffer solution to equalize at approximately 25°C (room temperature). Read and note the mA value. This reading is called the "offset" and it should be between 11 and 13 mA. If it is, the sensor "offset" is within factory-specified limits and the sensor "span" should now be checked using step 3. If not, discontinue this test and refer

to GLI's warranty/replacement plan on page 2 for details on sensor replacement.

3. Check the sensor "span" by measuring the mA value with the sensor in either pH 4 or pH 10 buffer. Keep the milliammeter connected as described in step 1.

A. Span Check In pH 4 buffer

Rinse sensor with water and place in pH 4 buffer. Allow temperature of sensor and buffer solution to equalize at 25°C (room temperature). The "span" reading should be 2.37 to 2.90 mA lower than the noted "offset" reading in step 2.

Example: Suppose "offset" reading in pH 7 buffer is 11.50 mA. Then the "span" reading in pH 4 buffer must be between 8.60 and 9.13 mA to be within factory-specified limits.

B. Span Check In pH 10 Buffer

Rinse sensor with water and place in pH 10 buffer. Allow temperature of sensor and buffer solution to equalize at 25°C (room temperature). The "span" reading should be 2.37 to 2.90 mA higher than the noted "offset" reading in step 2.

Example: Suppose "offset" reading in pH 7 buffer is 11.50 mA. Then the "span" reading in pH 10 buffer must be between 13.87 and 14.40 mA to be within factory-specified limits.

If the calculated "span" reading conforms with the limits in A or B of this step, perform step 4. If not, discontinue this test and refer to GLI's warranty/replacement plan on page 2 for details on sensor replacement.

4. To verify that the sensor's temperature compensator is operating properly, heat the buffer solution used in step 3 to 50°C. Place sensor in heated buffer. Allow sensor to equalize to the buffer temperature (50°C). Read the mA value. It should be the same mA value calculated in A or B of step 3, (+) or (-) 0.15 mA. If it is, the sensor's temperature compensator is operating properly. If not, refer to GLI's warranty/replacement plan on page 2 for details on sensor replacement.

3.3 Customer Assistance

Should service, parts or assistance in troubleshooting or repair be required, please contact your GLI representative or the GLI Customer Service Department:

Great Lakes Instruments, Inc.
8855 North 55th Street
Milwaukee, Wisconsin 53223

Telephone: 414/355-3601
Telefax: 414/355-8346

A description of the malfunction as well as the proper return address should accompany all sensors returned for repair, freight prepaid. All sensors out of warranty should be accompanied by a purchase order to cover costs of repair.

NOTE: *If the sensor is damaged during return shipment as a result of inadequate packaging, the customer assumes responsibility for repair costs. It is recommended to use the original GLI carton or an equivalent. Also, GLI will not accept sensors returned for repair or replacement unless they are thoroughly cleaned and all process chemicals are removed.*

PART FIVE - SPARE PARTS AND ACCESSORIES

	Description	Part Number
Sensor Accessory	Protector (for submersion applications)	60A2F0102
Standard Cell Supplies	Standard Cell Buffer (1 pint)	25M1A1001-115
	Gel Powder (for gelling standard cell buffer, 2 grams)	25M8A1002-101
	Salt Bridge: For epoxy sensors	60-9765-000*
	For vinyl ester sensors	60-9766-000*
	*Some applications require a special salt bridge (identified by a different dash number). When ordering, specify complete number including the dash number.	
	Salt Bridge O-ring for epoxy sensors	99X5H1261
	Salt Bridge O-ring for vinyl ester sensors . .	99X5H1236
pH Buffers For Calibration And Operation Checks	pH 7 Buffer (1 pint)	99X3A0421
	pH 4 Buffer (1 pint)	99X3A0422
	pH 10 Buffer (1 pint)	99X3A0942

"QUALITY PUMPS SINCE 1939"

ZOELLER CO.



FMO-447

0689

Supersedes

0389

**NOTICE: VENT HOLE
FOR CHECK VALVE
SEE #10 BELOW
AND # 6 PAGE 2**

3280 OLD MILLERS LANE
P.O. BOX 16347 • LOUISVILLE, KY. 40216
(502) 778-2731 • FAX (502) 774-3624



INSTALLATION INSTRUCTIONS

RECOMMENDED MODELS

SEWAGE	EFFLUENT*	DEWATERING
262 Series 266, 267, 268 Series 282, 284 Series 293, 294, 295 Series 292 Series	53, 55, 57, 59 Series 97 Series 137, 139 Series 161, 163, 165 Series 185, 188, 189 Series	All Models

*Effluent systems should specify that pumps should not handle solids exceeding three fourths inch (¾") in order to prevent large solids from entering leeching fields, mound systems and etc. (50/90 Series have ½", 130 Series have ¾", 160/180 Series have ¾", solids capability.) Where codes permit, sewage pumps can be used for effluent systems.

PREINSTALLATION CHECKLIST — ALL INSTALLATIONS

1. Inspect your pump. Occasionally, products are damaged during shipment. If the unit is damaged, contact your dealer before using.
2. Carefully read the literature provided to familiarize yourself with specific details regarding installation and use. These materials should be retained for future reference.
3. Make sure there is a properly grounded receptacle available. All pumps are furnished with provisions for proper grounding to protect you against the possibility of electrical shock.
(SEE WARNING BELOW)
4. Make certain that the receptacle is within the reach of the pump's power supply cord. **DO NOT USE AN EXTENSION CORD.** Extension cords that are too long or too light do not deliver sufficient voltage to the pump motor. But, more important, they could present a safety hazard if the insulation were to become damaged or the connection end were to fall into the sump.
5. Check to be sure your power source is capable of handling the voltage requirements of the motor, as indicated on the pump name plate.
6. Make sure the pump electrical supply circuit is equipped with fuses or circuit breakers of proper capacity. A separate branch circuit is recommended, sized according to the "National Electrical Code" for the current shown on the pump name plate.
7. Testing for Ground. As a safety measure, each electrical outlet should be checked for ground using an Underwriters Laboratory Listed circuit analyzer which will indicate if the power, neutral and ground wires are correctly connected to your outlet. If they are not, call a qualified licensed electrician.
8. For Added Safety. Pumping and other electrical equipment must be connected to a three prong grounded receptacle with integral ground-fault circuit interrupter. (GFCI)
9. **WARNING:** The installation of automatic pumps with mercury float switches or non-automatic pumps using auxiliary mercury float switches is the responsibility of the installing party and care should be taken that the tethered float switch will not hang up on the pump apparatus or pit peculiarities and is secured so that the pump will shut off. It is recommended to use rigid piping and fittings and the pit be 18" or larger in diameter.
10. Information - vent hole purpose. It is necessary that all submersible sump, effluent, and sewage pumps capable of handling various sizes of solid waste be of the bottom intake design to reduce clogging and seal failures. If a check valve is incorporated in the installation, a vent hole (approx. 3/16") must be drilled in the discharge pipe below the check valve and pit cover to purge the unit of trapped air. Trapped air is caused by agitation and/or a dry basin. This vent hole should be checked periodically for clogging. The 50 Series pumps have a built in vent hole.

CAUTIONS & WARNINGS

WARNING:

FOR YOUR PROTECTION, ALWAYS DISCONNECT PUMP FROM ITS POWER SOURCE BEFORE HANDLING. Single phase pumps are supplied with a 3-prong grounded plug to help protect you against the possibility of electrical shock. **DO NOT UNDER ANY CIRCUMSTANCES REMOVE THE GROUND PIN.** The 3-prong plug must be inserted into a mating 3-prong grounded receptacle. If the installation does not have such a receptacle, it must be changed to the proper type, wired and grounded in accordance with the National Electrical Code and all applicable local codes and ordinances. Three phase pumps must be installed in accordance with the National Electrical Code and all applicable local codes and ordinances.

CAUTION: Installation and checking of electrical circuits and hardware should be performed by a qualified licensed electrician.

CAUTION: Repair and service should be performed by Zoeller Company Authorized Service Station only.

CAUTION: Dewatering sump pumps are not designed for use in septic tanks to handle sewage or effluent.

CAUTION: Maximum continuous operating temperature for standard model pumps must not exceed 130°F - 54°C.

7



"EXTRA PROTECTION SYSTEMS"

THE BASEMENT SENTRY

12 Volt back-up sump pump system model 505

Application

For clear water, emergency back-up usage when power is off or primary pump fails.

Extra Protection - when the primary AC pump fails due to power outages or system problems.

- Storms
- Brownouts
- Wiring or electrical problems

Extra Protection - When the primary pump fails to keep up with excessive water due to rain or overloading.

Ft. Head Capacity GPH

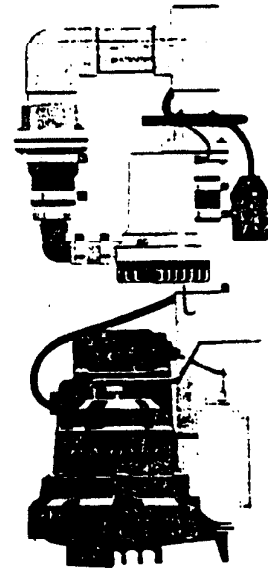
5	1500
10	1000
15	450
18	Lock Valve

Includes:

- Pump and control
- Charger
- Fittings
- Battery Case
(Battery Not Included)

For submersible or pedestal installations.

See FM0844 for information.



TWO PUMP SYSTEM

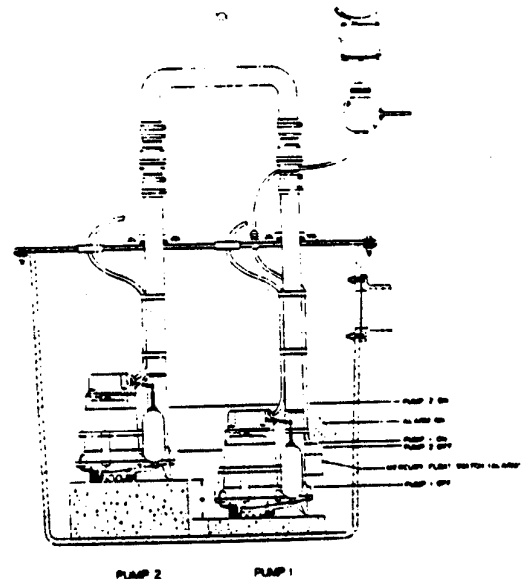
The "Extra Protection" Two-Pump system is an economical solution to the costly duplex alternating pump system and it's easy to install.

The "Extra Protection" Two Pump System consists of:

- a. The two automatic pumps of your choice
- b. One Alarm System
- c. Two Unicheck Valves as required

ADVANTAGES

- (1) The two-pump system offers high pump performance without the high price. It is a system that fits your needs and your budget.
- (2) Delivers more dependability than a single pump system and greatly reduces the chance of costly and time consuming problems associated with wear out or damages and the resulting system failures.
- (3) Affords greater satisfaction and peace of mind to all concerned by providing state of the art protection for costly and expensive surroundings.
- (4) Easy and economical to install.



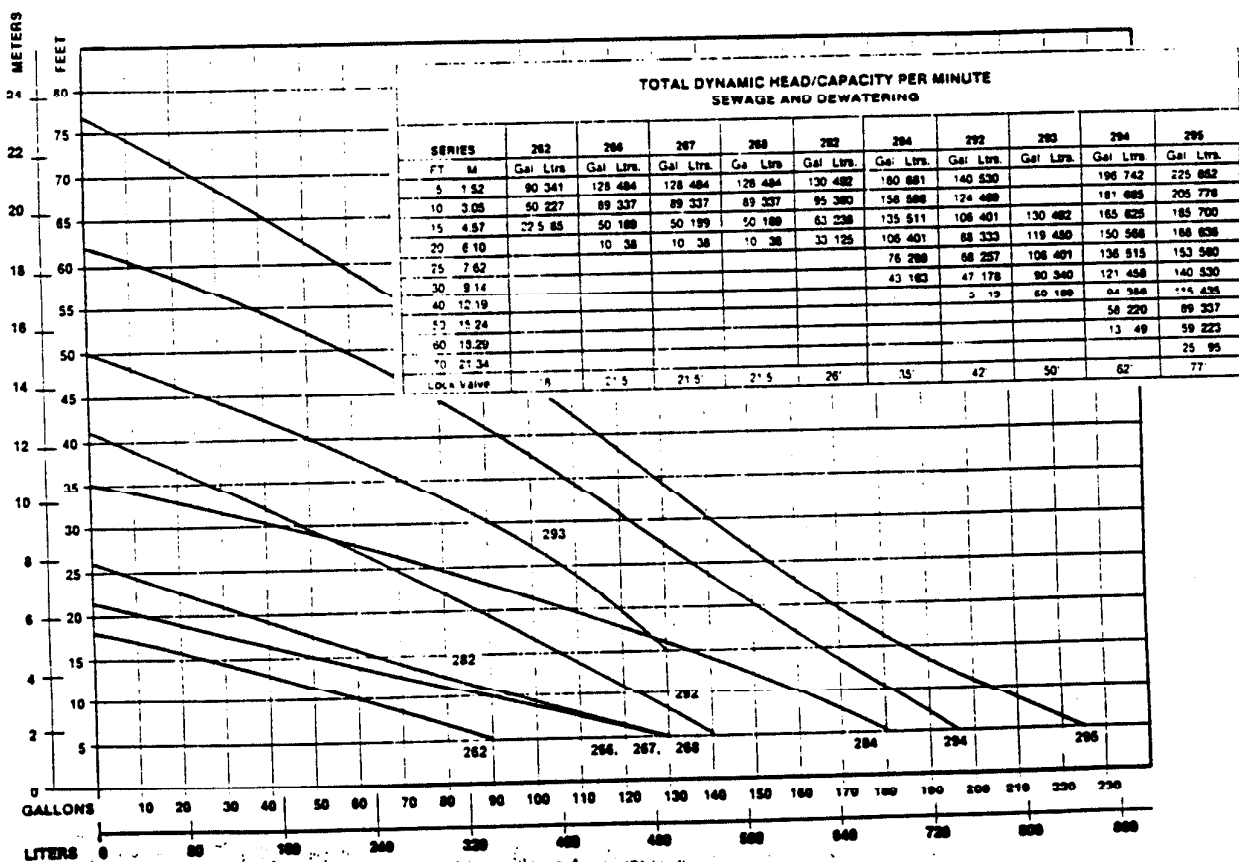
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Warning: Model 185 should not be subjected to less than 30 feet TDH.

Note: For Head Capacity on Model 112, industrial column-explosion proof pump, see FM 219.

WARNING: Model 293 should not be subjected to less than 15 feet TDH.



Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.



FM0157
0589
Supersedes
0388

3280 Old Millers Lane P.O. Box 16347 Louisville, Kentucky 40216 (502) 778-2731 • FAX (502) 774-3624

AUTHORIZED SERVICE STATIONS

CANADA

Alberta			
Calgary	James Electric	C7-6115 3rd Street S.E.	403-252-8897
Saskatchewan			
Regina	Electric Mtr. Serv.	1234 Scarth St. S4R2E5	306-525-5484

UNITED STATES

Alabama

Birmingham	B & D Elec. Mtr. Co.	3320 4th Ave. South 35233	205-251-6241
Birmingham	Brannan Elec. Mtr. Co.	3322 6th Ave. South 35233	205-222-0495
Dorran	Robbins Elec. Mtr. Serv.	1305 S. Oates St. 36301	205-792-1555
Huntsville	Kelsey Elec. Mtr. Serv.	4644 Commercial Dr. N.W. 35814	205-837-8150
Mobile	Morrer Elec. Mtr. Co.	1200 Mulson Dr. 36609	205-344-8496
Montgomery	Standard Elec.	421 Randolph Street 36107	205-262-6277

Alaska

Anchorage	Alaska Pump & Supply	281 East 56th Ave. 99502	907-563-3424
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Arkansas

Camden	Parker Electric Co.	Mt. Holly Rd. 71701	501-231-4355
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Arizona

Phoenix	Medlin Electric Co.	105 S. 30th Street 85034	602-273-7493
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California

Brisbane	S.monds Machinery Co.	306 Industrial Way 94005	415-482-1930
Los Angeles	Arbuckle Elec. Mtrs. Inc.	7543 Santa Monica Blvd. 90046	213-876-7100
Los Angeles	Clark's Electric	4425 Fountain Ave. 90029	213-666-0972
Oakland	East Bay Pump	1037 50th Ave. 94601	415-532-1800
Palo Alto	Clark Motor Service	7802 Woodley Ave. 91406	213-781-1039

Colorado

Boulder	Boulder Elec. Mtr.	3657 Walnut St. 80502	303-443-1331
Denver	Bob's Electric Mtr.	1221 South Bannock 80223	303-744-3297
Denver	Parker Electric Co.	2424 East 40th Ave. 80205	303-292-2537
Denver	Industrial Repair Serv.	3029 Larimer Street 80205	303-296-8636
Fort Collins	Larimer Elec.	1608 E. Lincoln 80524	303-484-8411
Grand Junction	Cowdell's Sales & Service	1755 Main Street 81501	303-245-3158

Connecticut

Ansonia	B & J Elec. Mtr. Repair	30-38 Maple St. 06401	203-734-1895
Cos Cob	Greenwich Motor Repair	105 River Road 06807	203-809-2441
Danbury	Industrial Electric Mtrs.	64 Main Street 06810	203-743-9611
Hamden	Bar Craft Electric Co.	12 Astor St. 06514	203-624-9915
Meriden	Renable Elec. Mtr. Inc.	285 Murchy Road 06614	203-522-2257
Rockville	Shaw's Pump Company	20 Lyons St. 06860	203-672-0021

Delaware

Creswood	Ray's Electrical Service Rt.	42 Main Street 19636	302-674-3199
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Florida

Clearwater	Cornett Electric Co.	717 Drew Street 33513	813-446-3199
Fluoroburg	Peninsular Armature	3056 N.E. 12 Terr. 33334	305-563-5627
Miami	Biscayne Elec. Motor	3030 NW 14th Street 33158	305-681-8171
Miami	Cindy San Corp.	9270 S.W. 58 Terr. 33173	305-270-0985
Miami	King Elec. Mtr. Service	280 N.W. 54th Street 33127	305-754-3482
Ocala	Motion Elec. Mtr.	218 N.E. 14th St. 32670	904-732-6605
Pensacola	Gu-Elec. Mtr.	124 North Del Villiers 32501	304-433-5134
Port St. Lucie	Full-Start Pump & Sprinkler	749 S.E. Lansdowne 33552	813-728-2244
Safety Harbor	Hydro Pump Repair	625 Harbor Lake Drive 33572	813-728-2244
W Hollywood	Air Electric	2402 S.W. 57th Terrace 33023	305-962-6522

Georgia

Brunswick	Southern Tri-State Elec.	1920 Second St. 31520	912-264-9379
Fitzgerald	Wynn Electric	P.O. Box 1002 31750	912-423-5495
Winston	Jay Electric	794C Highway #78 30187	404-942-2584

Idaho

Boise	Missman Elec. Co.	2422 W. Main St. 83705	208-344-6539
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Illinois

Bloomington	The Struck Co.	1106 E. Bell St. 61701	309-827-4691
Bradley	Arthur Motor Works Inc.	358 S. Kinzie Ave. 60915	815-833-6583
Champaign	Floyd Elec. Inc.	133 W. Kenyon Rd. 61820	217-352-0571
Chicago	All Elec. Mtr. Repair	6726 S. Ashland Ave. 60638	312-625-2404
Chicago	Precision Pump	3514 W. Fullerton Ave. 60647	312-276-1300
Danville	Modern Machine Shop	123-125 N. Hazel St. 61832	217-445-0742
Decatur	Stam's Motor Rewinding	168 S. Milton 62521	217-428-0115
Elk Grove Vll.	Fluid Pump Serv.	189 Segers Rd. 60007	312-228-0750
Freeport	Koym Elec. Mtr.	417 S. Locust Street C1032	815-733-0611
Galesburg	Midland Elec. Mtr. Works	932 Monmouth Blvd. 61401	309-342-4125
Grayslake	Krug-Northern & Elec. Mtr.	123 Hawley St. 60030	312-223-2410
Joliet	Pottiers Industrial Elec.	510 Ruby St. 60435	815-725-5919
Morton Grove	R & A Elec. Serv.	571 N. Chicago St. 60432	815-727-4864
Normal	Trans-Tek Sales, Inc.	6288 W. Oakton St. 60057	312-470-6631
Pana	S.W.R. Service	300 E. Pine Street 61781	309-452-9245
Peoria	Pana Pump & Motor Co.	308 E. 1st St. 61602	309-676-1371
Pontiac	Foremost Elec. & Trans. Inc.	918 S.W. Adams St. 61784	815-844-7181
Rockford	Frank's Electric Mtr.	2057 23rd Ave. 61109	815-398-2313
Round Lake	Impenal Mtr. & Armature	24567 W. Lake Shore Dr. 60073	312-548-3842
Schaumburg	Benchmark Sales & Serv.	801 Lunt Ave. 60153	312-980-9814
South Elgin	Floide Electric	110 Stevenson Rd. 60177	312-695-4734
Spring Valley	Valley Elec. Co.	701 W. Dakota St. 61362	815-663-8431
Springfield	Modern Elec. Mtr.	1112 E. Edwards St. 62703	217-523-2362

Indiana

Edinburgh	EMR Corporation	111 E. Center Cross 46124	812-526-2327
Greenfield	Eastside Pump Co.	6278 W. 400 No. 46140	812-526-2327
Hammond	Mus Electric Co.	4828 Calumet Ave. 46327	317-854-7141
Indianapolis	Harmer Electric Co.	1521 E. Washington St. 46201	219-931-3114
Martinsville	Hydra-Serv	4303 S. High School Rd. 46241	317-856-7031
Mich. City	Martinsville Elec. Mtr.	429 E. Morgan 46151	317-849-0641
Monterey	Rooney Elec. Co.	213 Arthur Street 46360	219-874-4225
South Bend	Roberts Plumbing & Repair	8326 Jackson 46321	219-836-9006
Vincennes	Northern Electric Co.	116 N. Hill St. 46067	812-882-8816
		604 S. 3rd St. 47591	

Iowa

Ames	Reese Elec. Mtr. Co. Inc.	202 East Ave. 50010	515-232-5321
Burlington	Larry's Elec. Mtr. Serv.	602 Washington Box 925 52601	319-752-3636
Clear Lake	Hupp Electric Mtr. Co.	275 33rd Ave. S.W. 52404	319-366-0761
Cherokee	Beal's Mtr.	Rewinding 600 West Beach 51012	712-225-6173
Clinton	G & O Electric Co. Inc.	114 South Second St. 53732	319-242-0132
Davenport	Industrial Eng. Equip. Co.	1958 W. River Dr. 52802	319-323-9721
Des Moines	Electric Pump & Tool Serv.	1520 Walnut 50309	515-288-0245
Dubuque	Ellis Appliance & Service	3370 Central Ave. 52001	319-582-3953
Fort Dodge	Larsen Elec. Mtr. Serv.	1229 First Ave. So. 50501	515-573-7331
Iowa City	Electric Mtr.	1518 Highway West 52240	319-339-1751
Marshalltown	Smith Engine City Co.	Highway 65 South 50135	515-543-4624
Marshalltown	Eggleston Electric Co.	1206 E. Main St. 50158	515-752-4678
Ottumwa	Halliday Electric Co.	432 S. Iowa Ave. 52501	515-684-1759
Sioux City	Mid City Electric	507 Iowa Street 51105	712-255-1939
Tipton	Tipton Elec. Motor Inc.	107 W. 2nd St. 52771	319-886-3161
Walden	Mid City Electric	1819 Falls Ave. 50701	319-232-3662

Kansas

Chanute	Nicewaner Elec. Mtr.	313 East Main 66720	316-431-0290
Hutchinson	Central Elec. Mtr. Serv.	125 West E. F. 79504	316-563-6114
Kansas City	Allen Armature & Elec. Co.	10 S. 18th St. 66102	316-217-9999
Topeka	P & F Elec. Mtr. Co.	4004 West 21st St. 66604	913-272-8504
Wichita	B & B Elec. Mtr. Co.	332 Lulu 67211	316-267-1238

Kentucky

Allen	Porter Industries, Inc.	P.O. Box 380 41601	606-874-2125
Corbin	Cyrtner Bros. Elec.	304 North Lynn Ave. 40701	502-526-5954
Fayetteville	Town Electric	4420 Bardston Road 42701	502-737-4824
Harlan	Carroll Engineering Co.	my 7840 Lammert 40601	502-573-5804
Heidrick	B & B Pump Repair	C/O Davis Mtr. Maint 40948	606-546-8851
Lexington	Kentucky Serv. Co.	622 S. Mill St. 40508	606-254-6312
Louisville	Clark Electric Co.	713 So. 28th 40211	502-778-1676
Louisville	Electric Motor Repair	311 East Barber 40217	502-635-2927
Louisville	Jimmy's Elec. Mtr. Serv.	2430 Bowman Ave. 40217	502-634-3648
Louisville/Lyndon	Quality Elec. Mtr.	8200 Vincennes Ave. 40222	502-426-3396
Paducah	Sinclair Elec. Serv.	627 Park Ave. 42001	502-442-6257

Louisiana

Alexandria	Elec. Mtr. Serv.	1123 Washington St. 71309	318-442-5645
Baton Rouge	Power Tool Repair Serv.	2025 Scenic Hwy. 70802	504-356-0101
Baton Rouge	J & J Armature Works	1812 St. St. 70801	504-439-8849
Lake Charles	J & M Electric	1725 Court Street 70113	504-584-6100
New Orleans	Tench Elec. Mtr. Works	1616 Market St. 71101	318-221-8315
Shreveport	Joe's Elec. Power Tools	808 E. Canton St. 70663	318-527-3020
Sluphor	Quaschta Elec. Serv.	212 Haynes 71291	318-323-2525
West Monroe			

Maine

Bangor	Errol Cleveland & Son	78 Harvard St. 04401	207-942-5326
Bridgford	Hector Elec. Mtr. Serv.	16 Mt. Pleasant St. 04005	207-282-9435
Lewiston	Motor Power, Inc.	1505 Lagoon St. 04240	207-782-7017

Maryland

Brentwood	Chipman Elec. Co.	3831 38th St. 20722	301-277-3441
Hagerstown	Hagerstown Equip. Co.	Maryland Ave & Memorial 21740	301-733-7600

Massachusetts

Fairhaven	Delta Elec. Mtr. & Gen. Co.	379 Alden Rd. 02719	617-997-0582
Fitchburg	Shepard & Parker Inc.	18 Lincoln St. 01420	617-343-3907
Hudson	Elec. Mtr. Serv.	74 Apsey St. 01749	508-562-9977
Hyannis	Osterville Elec.	24 Warehouse Rd. 02601	508-778-5019
Lenox Dale	Berkshire Electric Mtrs.	Crystal St.	413-637-3255
Lyons	E.R. Sullivan Co. Inc.	21 Fayette St. 01902	617-582-8124
Springfield	Superior Electrical Corp.	94 Shaw's Lane 01104	413-739-3823
Stoughton	Kaiman Elec. Mtr.	489 Page St. 02072	617-341-4900

Michigan

Ann Arbor	Turner Elec. Mtr. Serv.	6800 Jackson Rd. 48301	313-682-4586
Auburn Hills	Smiley Elec.	3684 Auburn Road 48007	313-632-9135
Bay City	York Electric Motors	211 Andre Street 48708	517-684-7460
Battle Creek	Murphy Elec. Mtr.	118 Taft 49017	616-962-4078
Brighton	Brighton Pump Rpr.	9933 E. Grand River 48116	313-226-4429
Detroit	Howard Elec. Co.	4801 Bellevue 48207	313-923-0430
Detroit	Re-Nu Elec. Co.	20183 John R. 48203	313-366-1570
Detroit	Re-Nu Elec. Co.	209 W. Grand St. 48201	218-847-4858
Flint	Elec. Mtr. Serv.	2906 Longview Blvd. 48508	313-233-7210
Flint	Moore Brothers Elec.	2602 Lenth St. 48506	313-232-2148
Gaylord	Graham Mtr. & Generator Serv.	975 N. Center, On 27 49735	517-732-5055

SERVICE CHECK LIST

WARNING: ELECTRICAL PRECAUTIONS — Before servicing a pump, always shut off the main power breaker and then unplug the pump - making sure you are not standing in water and are wearing insulated protective sole shoes. Under flooded conditions, contact your local electric company or a qualified licensed electrician for disconnecting electrical service prior to pump removal.

WARNING: Submersible pumps contain oil which becomes pressurized and hot under operating conditions- allow 2 1/2 hours after disconnecting before attempting service.

CONDITION

- A. Pump will not start or run.
- B. Motor overheats and trips overload or blows fuse.
- C. Pump starts and stops too often.
- D. Pump will not shut off.
- E. Pump operates but delivers little or no water.
- F. Drop in head and/or capacity after a period of use.

COMMON CAUSES

Check fuse, low voltage, overload open, open or incorrect wiring, open switch, impeller or seal bound mechanically, defective capacitor or relay when used, motor or wiring shorted. Float assembly held down. Switch defective, damaged, or out of adjustment.

Incorrect voltage, negative head (discharge open lower than normal) impeller or seal bound mechanically, defective capacitor or relay, motor shorted.

Float tight on rod, check valve stuck or none installed in long distance line, overload open, level switch(s) defective, sump pit too small.

Debris under float assembly, float or float rod bound by pit sides or other, switch defective, damaged or out of adjustment.

Check strainer housing, discharge pipe, or if check valve is used vent hole should be open. Discharge head exceeds pump capacity. Low or incorrect voltage. Incorrect motor rotation. Capacitor defective. Incoming water containing air or causing air to enter pump.

Increased pipe friction, clogged line or check valve. Abrasive material and adverse chemicals could possibly deteriorate impeller and pump housing. Check line. Remove base and inspect.

If the above check list does not uncover the problem, consult the factory - Do not attempt to service or otherwise disassemble pump.

LIMITED WARRANTY

Zoeller Company warrants, to the purchaser and subsequent owner during the warranty period, every new Zoeller Company product to be free from defects in material and workmanship under normal use and service, when properly installed, used, and maintained, for a period of one year from date of installation or 18 months from date of manufacture, whichever comes first. Part(s) that fail (within one year of installation or 18 months from the date of manufacture, whichever comes first) that inspection determine to be defective in material or workmanship, will be repaired, replaced, or remanufactured at Zoeller Company's option provided, however, that by so doing we shall not be obligated to replace an entire assembly, the entire mechanism or the complete unit. No allowance will be made for shipping charges, damages, labor or other charges that may occur due to product failure, repair or replacement.

This warranty does not apply to any material which has been disassembled without prior approval of Zoeller Company, subjected to misuse, misapplication, neglect, alteration, accident or act of God; that have not been installed, operated or maintained in accordance with Zoeller Company installation instructions; that has been exposed to but not limited to the following: sand, gravel, cement, mud, tar, hydro carbons or hydro carbon derivatives (oil, gasoline, solvents, etc.) or other abrasive or corrosive substances, is in lieu of all other warranties

expressed or implied; and we do not authorize any representative or other person to assume for us any other liability in connection with our products.

Contact an authorized service station to obtain any needed repair or replacement parts. For additional information pertaining to our warranty or if service cannot be obtained locally, contact Zoeller Company, 3280 Old Millers Lane, Louisville, Kentucky 40216. Attn: Customer Service.

ZOELLER COMPANY EXPRESSLY DISCLAIMS LIABILITY FOR SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES OR BREACH OF EXPRESSED OR IMPLIED WARRANTY; AND ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND OF MERCHANTABILITY SHALL BE LIMITED TO THE DURATION OF THE EXPRESSED WARRANTY.

Some states do not allow limitations on the duration of an implied warranty, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.



YOUR ASSURANCE
OF QUALITY

EASY DO'S & DON'TS FOR INSTALLING A SUMP PUMP

- 1 **DO** read thoroughly all installation material provided with the pump.
- 2 **DO** inspect pump for any visible damage caused by shipping. Contact dealer if pump appears to be damaged.
- 3 **DO** clean all debris from the sump. Be sure that the pump will have a hard, flat surface beneath it. **DO NOT** install on sand, gravel or dirt.
- 4 **DO** be sure that the sump is large enough to allow proper clearance for the level control switch(es) to operate properly.
- 5 **DO Always Disconnect Pump From Power Source Before Handling.**
DO always connect to a separately protected and properly grounded circuit.
DO NOT ever cut, splice, or damage power cord.
DO NOT carry or lift pump by its power cord.
DO NOT use an extension cord with a sump pump.
- 6 **DO** install a check valve and a union in the discharge line.
DO NOT use a discharge pipe smaller than the pump discharge.
- 7 **DO NOT** use a sump pump as a trench or excavation pump, or for pumping sewage, gasoline, or other hazardous liquids.
- 8 **DO** test pump immediately after installation to be sure that the system is working properly.
- 9 **DO** cover sump with an adequate sump cover.
- 10 **DO** review all applicable local and national codes and verify that the installation conforms to each of them.
- 11 **DO** consult manufacturer for clarification or questions.
- 12 **DO** consider a Two Pump System with an alarm (Page 5) where an installation may become overloaded or primary pump failure would result in property damages.
- 13 **DO** consider a D.C. Backup System (See the Basement Sentry page 5) where a sump or dewatering pump is necessary for the prevention of property damages from flooding due to A.C. Power disruptions, mechanical or electrical problems or system overloading.



ZOELLER CO.

3280 Old Millers Lane
P.O. Box 16347
Louisville, Kentucky 40216
(502) 778-2731

Manufacturers of . . .

"QUALITY PUMPS SINCE 1939"

IF IT POURS IT PUMPS

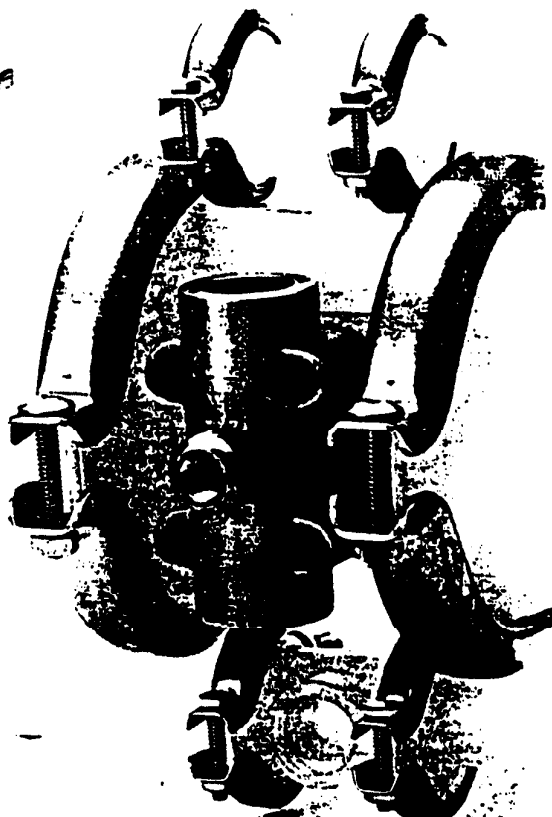
DIRECTIONS FOR INSTALLATION AND MAINTENANCE

WILDEN MODEL M-1

MODELS

M1/PO/PU/PU/PU
M1/KO/PU/PU/PU
M1/PC/PU/PU/PU
M1/KC/PU/PU/PU
M1/UO/TF/TF/TF
M1/UP/TF/TF/TF

M1/PT/TF/TF/PT
M1/KT/TF/TF/KT
M1/PP/TF/TF/PT
M1/KK/TF/TF/KT
M1/UH/TF/TF/TF
M1/UC/TF/TF/TF

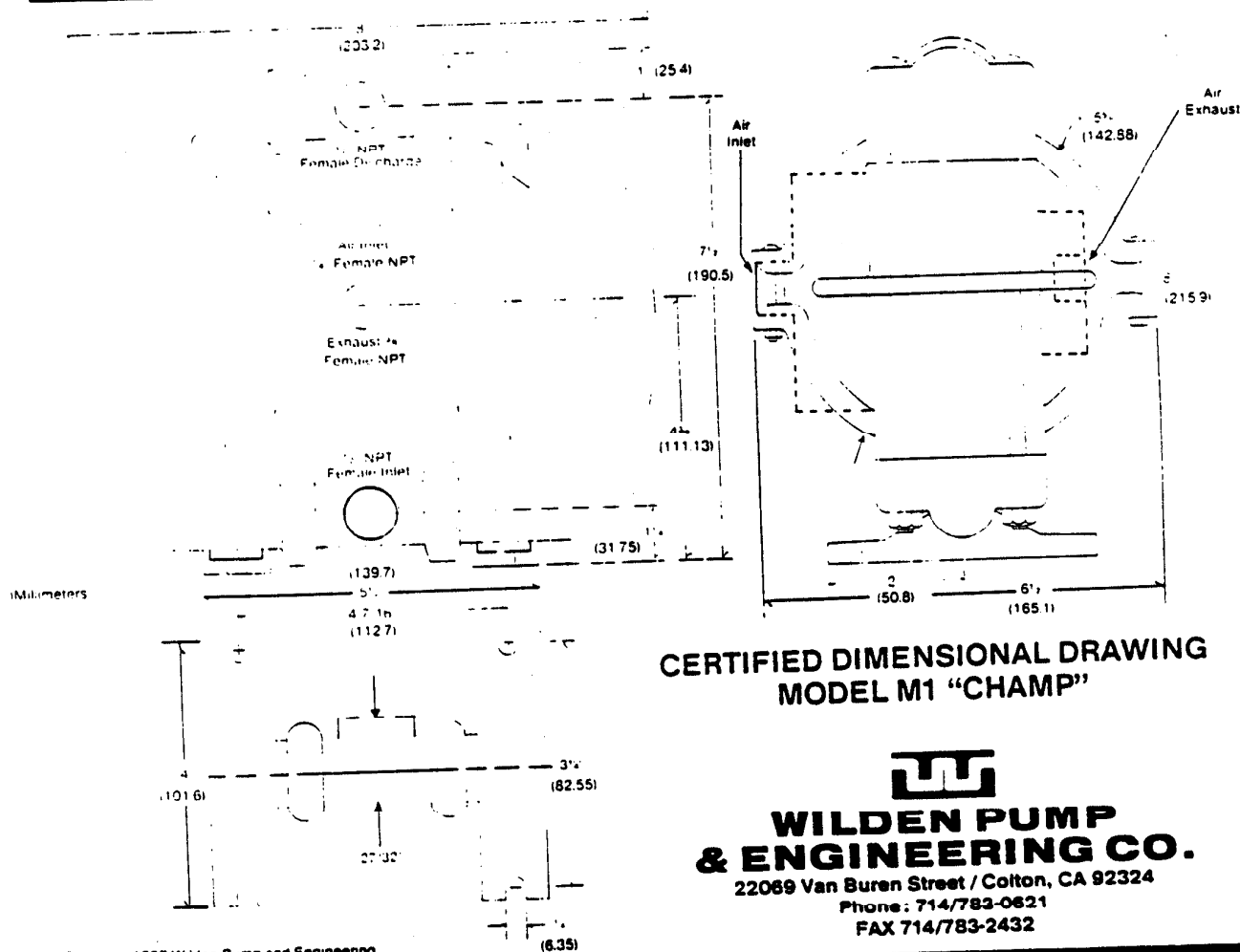
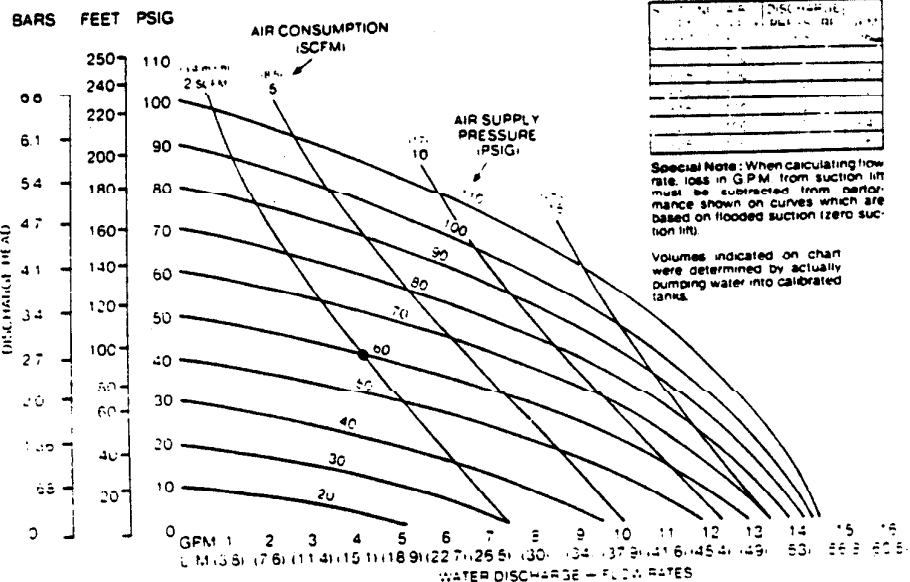


**WILDEN®
MODEL M1®**

Height	8 1/2"
Width	8"
Depth	6 1/2"
Weight	POLYPROPYLENE 9 lbs. PVDF 11 lbs. Teflon PFA 12 lbs.
Air Inlet	1/4" Female N.P.T.
Inlet	1/2" Female N.P.T.
Outlet	1/2" Female N.P.T.
Suction Lift	POLY { 15' Dry { 25' Wet TEFLON { 8' - 10' Dry { 25' Prumed
Max Size Solids	1/16" Dia.

Example: To pump 4 gpm against a discharge pressure of 40 psig requires 60 psig and 2 scfm air consumption. (See arrow on chart.)

Caution: Do not exceed 110 psig air supply pressure.



**CERTIFIED DIMENSIONAL DRAWING
MODEL M1 "CHAMP"**



**WILDEN PUMP
& ENGINEERING CO.**

22069 Van Buren Street / Colton, CA 92324

Phone: 714/783-0621

FAX 714/783-2432

SECTION I

WILDEN PUMP INSTALLATION / OPERATION INSTRUCTIONS

INSTALLATION

The Wilden "Champ" is a Wilden model M-1 pump (½-inch) with all wetted parts of injection molded polypropylene, PVDF, or Teflon® PFA material. Performance and operation of the "Champ" are essentially the same as other Wilden pumps of metal construction subject to temperature and chemical compatibility of the material being pumped with polypropylene, PVDF and Teflon® PFA.

The M-1 "Champ" comes standard with polypropylene non-wetted parts. The M-1 "Champ" should not be used for submersible applications unless both wetted and non-wetted portions are compatible with the material being pumped.

Suction pipe size should be at least ½" diameter or even larger if highly viscous material is to be pumped. If suction hose is used, it must be of a noncollapsible, reinforced type as the M-1 is capable of pulling a high vacuum. Discharge piping should be at least ½". It is critical, especially on the suction side of the pump, that all fittings and connections are airtight or a reduction or loss of pump suction capability will result.

THE M-1 PUMP WILL PASS ¼" DIAMETER SOLIDS. WHENEVER THE POSSIBILITY EXISTS THAT LARGER SOLID OBJECTS MAY BE SUCKED INTO THE PUMP, A STRAINER SHOULD BE USED ON THE SUCTION LINE.

The inlet to the air valve is ¼" NPT. The compressed air line to the pump should be at least ¼". The air line should be large enough to supply the volume of air necessary to achieve the desired pumping rate (see M-1 pump performance curve.) Use air pressure up to 110 psig depending upon pumping

requirements. Use air filter in front of pump. Blow out air lines for 10 to 20 seconds before attaching to pump to make sure all pipeline debris is clear.

CAUTION: Do not exceed 110 psig air supply pressure.

Pump discharge rate can be controlled by:

1. Limiting the volume and/or pressure of the air supply to the pump (preferred method). The use of a gate valve or needle valve installed at the air inlet to the pump is suggested for this purpose.
2. Throttling the pump discharge by installing a valve in the discharge line of the pump when the need to control the pump from a remote location exists. When the pump discharge pressure equals or exceeds the air supply pressure, the pump will stall out; no bypass or pressure relief valve is needed and pump damage will not occur.
3. When pump operation is controlled by a solenoid valve in the air line, a three-way valve should be used.

Sound level can be reduced below 90 dba by attaching our muffler at pump exhaust port.

Temperature Limits: Polypropylene +32 F to +175 F
Kynar® (PVDF) +10 F to +225 F
Teflon® PFA +20 F to +200 F @
100 psi, 300 F @ 30 psi
discharge head

CAUTION: Maximum temperature limits are based upon mechanical stress only. Certain chemicals will significantly reduce maximum safe operating temperatures. Consult engineering guide for chemical compatibility and temperature limits.

WARNING: PREVENT STATIC SPARKING — IF STATIC SPARKING OCCURS, FIRE OR EXPLOSION COULD RESULT. PUMP, DISPENSING VALVE, AND CONTAINERS MUST BE GROUNDED WHEN HANDLING FLAMMABLE FLUIDS SUCH AS SOLVENTS, PAINTS, LACQUERS, ETC. AND WHEREVER DISCHARGE OF STATIC ELECTRICITY IS A HAZARD.

OPERATING INSTRUCTIONS

A. The M1 "Champ" models come standard with "lube-free" air distribution systems, stemming from the utilization of proprietary treatments on both the air valve piston and the center block O-rings. However, due to the unique design of the system, it will perform well under conditions where "dirty" air (oil and water contaminants) are introduced naturally into the pump through industrial air systems. Furthermore, the addition of a 10W lubricant will extend the life of the valve, rather than lead to its premature failure. Under certain operating conditions lubrication may be necessary.

B. Make sure air line to pump is free from dirt or other foreign matter. Blow out air line for 10 to 20 seconds before attaching to pump, to make sure all pipeline debris is clear.

C. Turn on air supply to pump. CAUTION: Make sure air supply pressure to pump does not exceed 110 psig. If it does, a pressure regulator should be installed and set at a maximum of 110 psig.

D. Pumping volume (gpm) can be set by counting the number of strokes per minute. The M-1 pumps approximately .03 gallon per stroke. A stroke is 1/2 cycle or one air exhaust.

When pump is used for moving thick materials, check stroke rate to determine that pump is not operating at a faster rate than material is capable of flowing, or cavitation will occur. If pump is operating at a speed too fast for available flow, reduce the volume of air to the pump until stroke rate approximates discharge volume.

E. Always flush pump after use if material being pumped will pack or solidify. The pump can be turned upside down and all liquid will drain out.

TROUBLESHOOTING

Pump will not run or runs slowly:

1. Check air inlet screen for dirt, and/or air filter for debris.
2. Check for sticking air valve, flush air valve in solvent.
3. Check for worn-out air valve. If piston face in air valve is shiny instead of dull, air valve is probably worn beyond working tolerances and must be rebuilt by Wilden or replaced.
4. Check center block O-rings. If worn excessively they will not seal and air will simply flow through pump and out air exhaust. Use only Wilden O-rings as they are of special construction.

Pump runs but little or no product flows:

1. Check for pump cavitation; slow pump speed down to match thickness of material being pumped.
2. Check for sticking valve balls. If material being pumped is not compatible with pump elastomers, swelling may occur, replace balls and seats with proper elastomers.
3. Check to make sure all suction connections are airtight, especially clamp bands around intake manifold.

Air bubbles in pump discharge:

1. Check for ruptured diaphragm.
2. Check tightness of clamp bands, especially at intake manifold.

Product comes out air exhaust:

1. Check for diaphragm rupture.
2. Check tightness of piston plates to shaft.
3. Ensure piston O-ring is in place, if required on model involved.

Pump Air Valve Freezes:

Check for excessive moisture in compressed air. Either install dryer or hot air generator for compressed air or use an anti-freeze such as Tannergas or Killfrost in lieu of SAE 10W oil.

CAUTION: WEAR SAFETY GLASSES. WHEN DIAPHRAGM FAILURE OCCURS, MATERIAL BEING PUMPED MAY BE FORCED OUT AIR EXHAUST.

SECTION II

DIRECTIONS FOR DISASSEMBLY/REASSEMBLY

CAUTION: Before any maintenance or repair is attempted, the compressed air line to the pump should be disconnected and all air pressure allowed to bleed from pump. Disconnect all intake, discharge, and air lines. Drain the pump by turning it upside down and allowing any fluid to flow into a suitable container.

The Wilden pump model M-1 is an air-operated, double-diaphragm pump with all wetted parts moulded in either pure, unfilled Polypropylene, pure unfilled PVDF, or pure Teflon® PFA. The single-piece center section, consisting of center block and air chambers, is moulded from glass-filled Polypropylene. All fasteners and hardware are stainless steel. The air valve is brass. All O-rings used in the pump are of a special material, and should only be replaced with factory-supplied parts.

Tools required to perform maintenance on the model M-1 pump are: 3/16 inch Allen wrench, 7/16 inch, 5/16 inch, and 3/8 inch wrenches, two open end adjustable wrenches, and an O-ring pick.

PLEASE read all directions before starting disassembly.

DISASSEMBLY

Step 1.

Before actual disassembly is started, turn pump upside down and drain all liquid trapped in the pump into a suitable container. Be sure to use proper caution if liquid is corrosive or toxic. Mark each liquid chamber to its respective air chamber for easy alignment during reassembly.

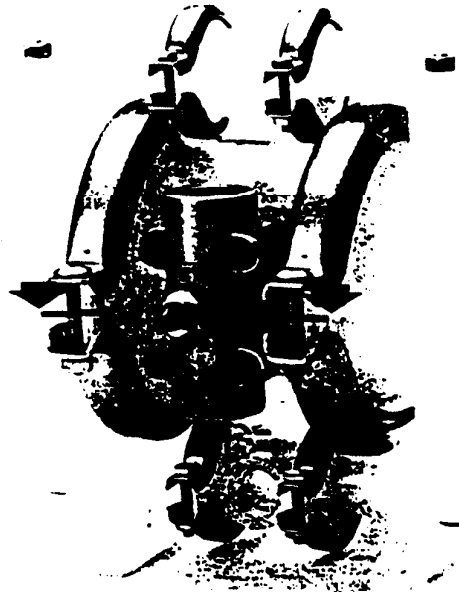


Figure 1

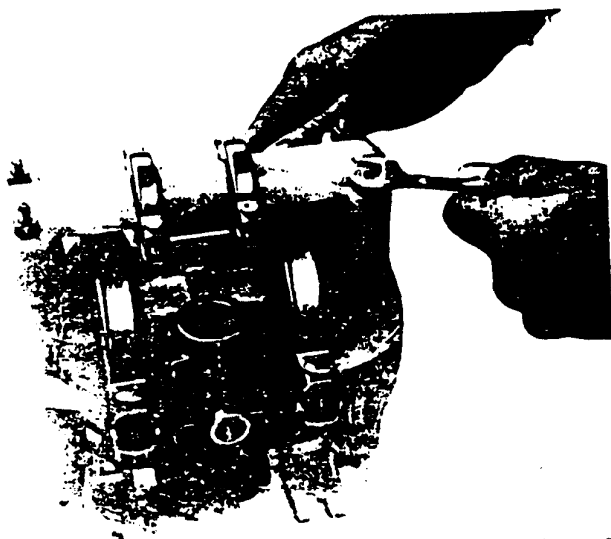


Figure 2

Start by removing the nuts from the four long bolts that hold the top and bottom manifold to the center section.

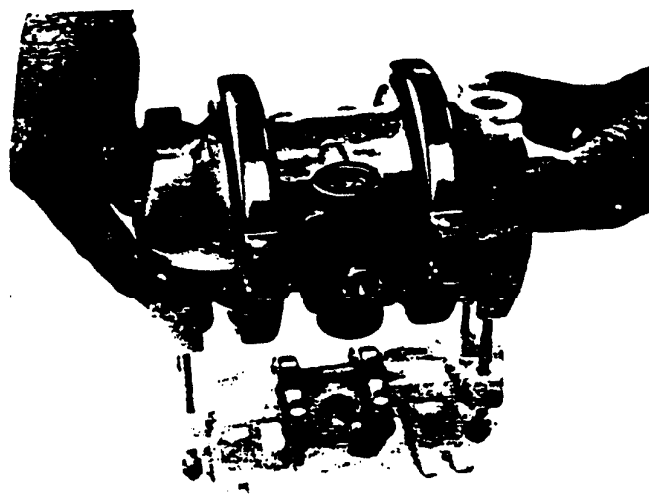


Figure 3

Remove the top manifold and lift the center section off the inlet manifold.

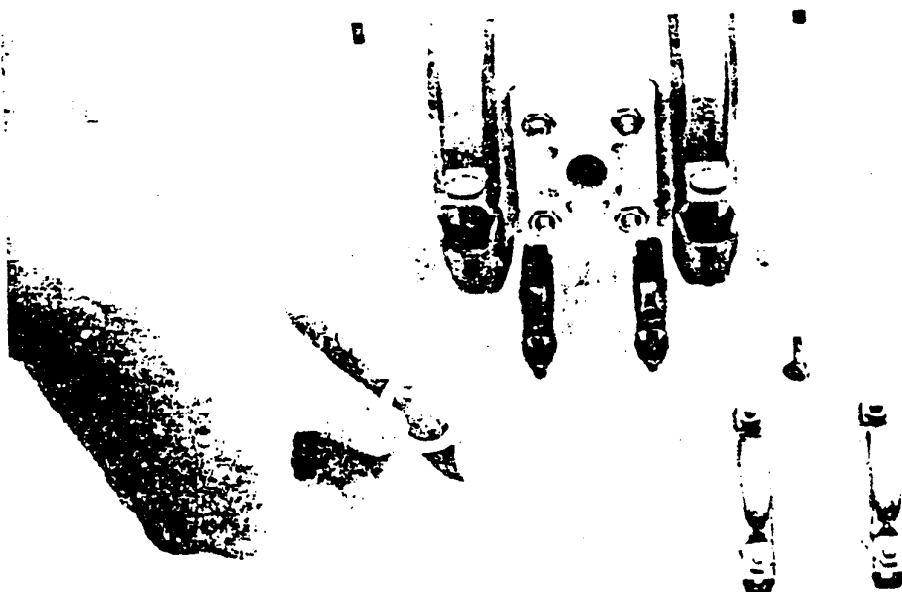


Figure 4

Step 2.

Set the center section aside and inspect the discharge manifold. The discharge valve ball, seat, and sealing O-rings should now be inspected for wear and chemical attack. If the ball is round and not deeply scratched, it is still serviceable. Inspect the seat area where the ball valve rests. It should be smooth with no cuts. If this area is damaged, poor vacuum will result. Note: pumps equipped with Teflon[®] diaphragms, ball and O-rings use an expanded Teflon[®] gasket material as an aid in sealing between manifolds and around the Teflon[®] diaphragm. This gasket should be replaced whenever the pump is disassembled. Gasket kit P/N TF1GK should be ordered for this purpose. Instructions for replacing these gaskets are on page 8.

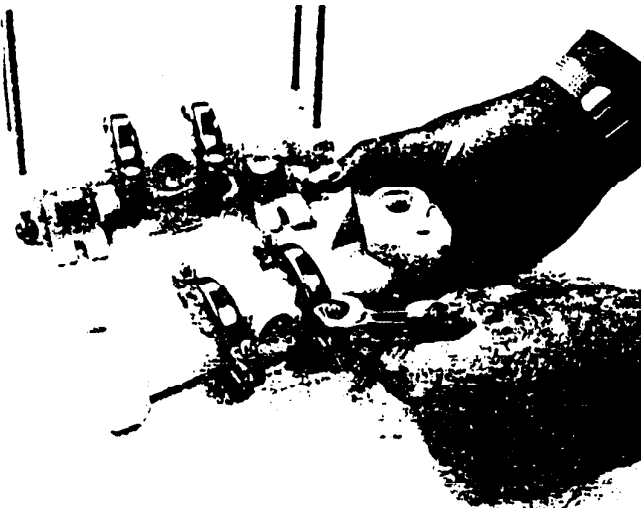


Figure 5

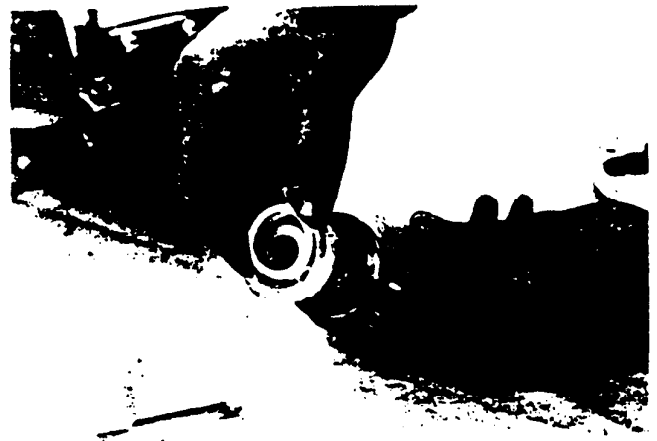


Figure 5A

Step 3.

Normally the inlet or discharge manifold should not be disassembled during pump maintenance or repair. However, if this is necessary, or if the angle of the discharge or inlet opening needs to be changed, the clamp bands should be completely removed and the band itself should be disassembled. Taking the bands apart is necessary to simplify manifold reassembly. Set the manifold and bands aside.



Figure 6

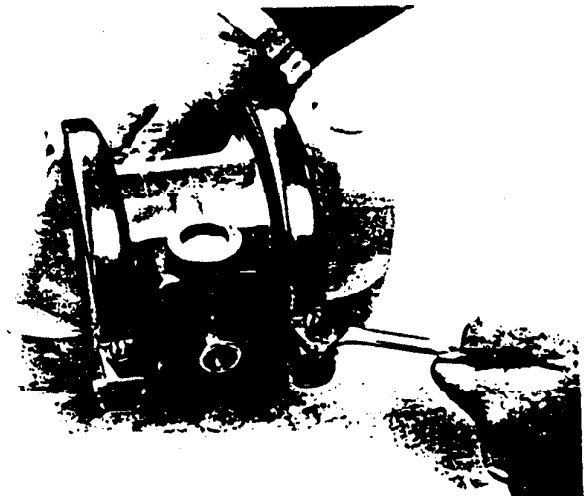


Figure 6A

Step 4.

Turn the pump center section upside down and remove and inspect the inlet valve balls, seats, and sealing O-rings. If damage is apparent, or swelling or cracking of the valve balls is observed, these parts should be replaced upon pump reassembly. If Teflon sealing O-rings are used, they will generally need to be replaced at every pump takedown. Teflon has no "memory" and will not return to its original shape.

Use a 7/16 inch wrench to remove the clamp bands that hold the water chambers to the one-piece air chamber/center block.

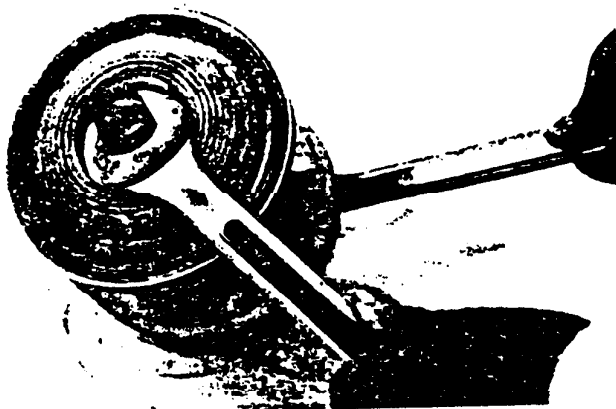


Figure 7A

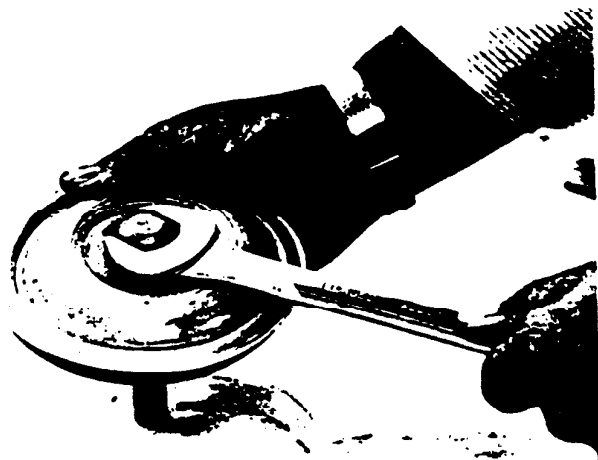


Figure 7B

Step 5.

Use the two adjustable wrenches to loosen the diaphragm piston plate from the connecting shaft. Only one piston plate will loosen. Remove it and the diaphragm. Remove the shaft and attached diaphragm from the center block. To remove the diaphragm from the shaft, hold the outer rim of the diaphragm and loosen the diaphragm piston plate with the adjustable wrench. If the plate will not loosen, the shaft must be placed in a vise. **Protect the shaft from damage by using wood blocks or soft jaws in the vise.** The plate can now be easily removed with the adjustable wrench.

At this point of disassembly, all wetted parts of the pump are available for inspection or repair. If inspection, and/or servicing, of the non-wetted air section is necessary, please see Section 2.

ASSEMBLY

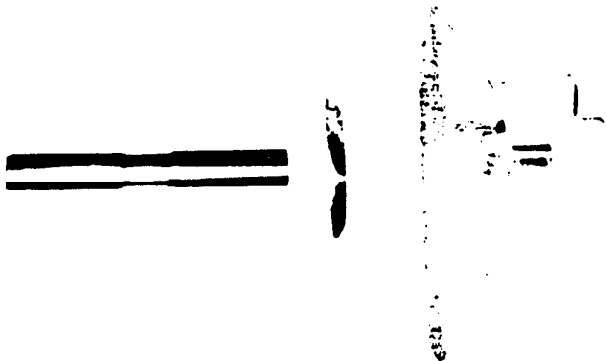


Figure 8A

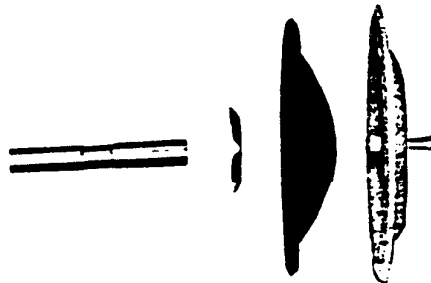


Figure 8B

Step 1.

First, install diaphragm and inner and outer piston on shaft. Observe **this side out** markings on diaphragm. Hand tighten only at this time, the outer piston to the shaft. Note: pumps equipped with Teflon® diaphragms require that backup diaphragm (P/N TF93B) be used. See Figure 8B.

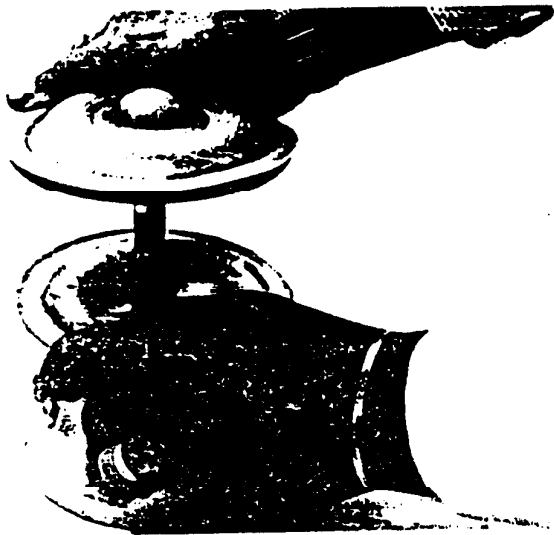


Figure 9A

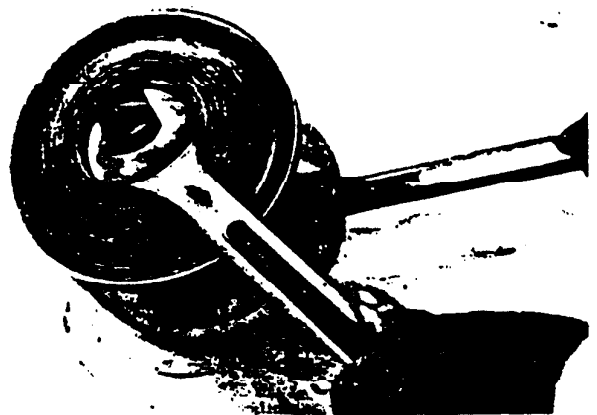


Figure 9B

Step 2.

lightly lubricate the shaft and insert it through the center block bushing. Install the opposite outer piston, diaphragm(s) and inner piston and tighten to approximately 100 in. lbs.



Figure 10A

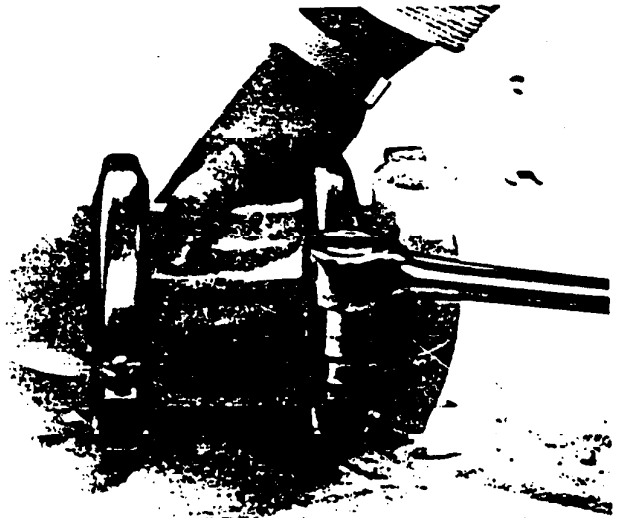


Figure 10B

Step 3.

Polyurethane Diaphragms. Locate one diaphragm so that its outer bead gently rests in the groove provided for it in the center section. Place the water chamber on the diaphragm using the alignment marks previously made during disassembly. Install and tighten the clamp band. (Tighten to 40 in. lbs.).

Install the second water chamber as above. Note: it may be necessary to adjust the diaphragm position slightly so that the bead gently rests in its groove in the center section.

Step 3A.

Teflon Diaphragms. M-1 pumps equipped with Teflon® diaphragms require the use of a Teflon® gasket kit, P/N TF1GK. The Teflon® gasket material in this kit is an expanded type of Teflon® which is very strong but soft. Its use assures a positive seal between the Teflon® diaphragm outer bead and its corresponding groove in the water chamber. This gasket material should be replaced each time the pump is disassembled.



Figure 11A

Select a strip of 3/16" wide material approximately 15 inches in length and carefully remove the covering from the adhesive strip (see Figure 11A). Ensure that the adhesive remains attached to the gasket material.

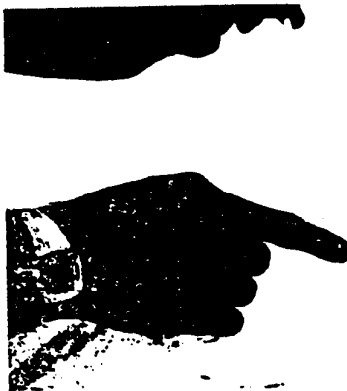


Figure 11B

Starting at any point, place the gasket strip in the center of the diaphragm bead groove on the water chamber (P/N P95) and press lightly on the gasket to ensure that the adhesive holds it in place during assembly (see Figure 11B).



Figure 11C

The ends of the gasket strip should overlap approximately 1/2 inch (see Figure 11C).

After the gasket material is installed, proceed as in Step 3.



Figure 12A

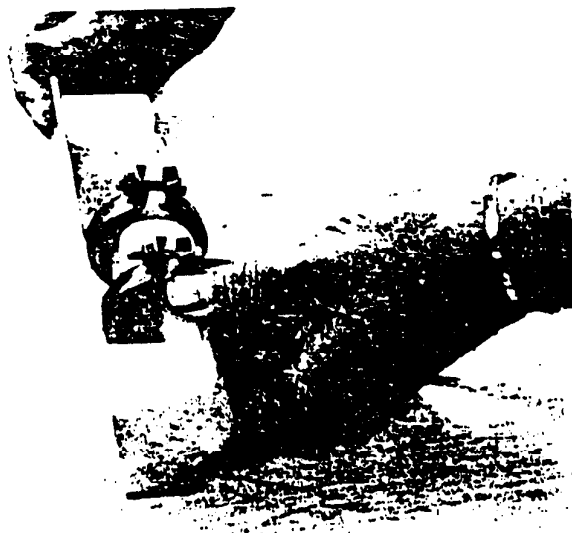


Figure 12B

Step 4.

Manifold Assembly. If the inlet and/or discharge manifold was taken apart, it should be reassembled now. The easiest way to do this is to take one half clamp band and wedge it onto the flanges of the elbow and center T-section. (See Figure 12A). This holds the two parts together while the second half band is installed and the bolts are hand-tightened. Attach the other elbow to the center T-section as above. Align the manifold parts as in Figure 12B, and final tighten the clamps (10 in. lbs.). Note: on pumps equipped with Teflon® diaphragms, balls and sealing rings, Teflon® gaskets should be used between the flanges of the manifold. (see Step 5).

Step 5.

If the pump is equipped with optional Teflon® diaphragms, valve balls, and sealing rings around the valve seats, new Teflon® gaskets must be installed. The small flange manifold connections of the M-1 "Champ" pumps are sealed with a Teflon® O-ring (P/N TFE110B) and a circular gasket. The gaskets are held in place during assembly by two adhesive strips. After installing the valve balls, valve seats and O-rings in the bottom of each water chamber (P/N P95) and discharge manifold elbow (P/N P96), place a circular gasket in position.

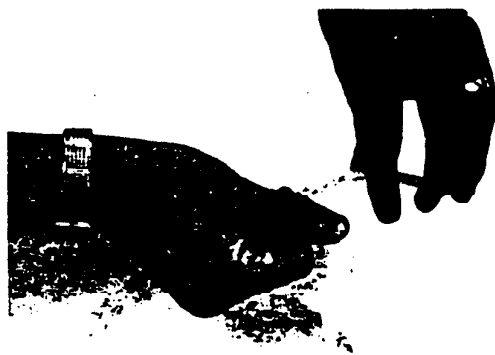


Figure 13B

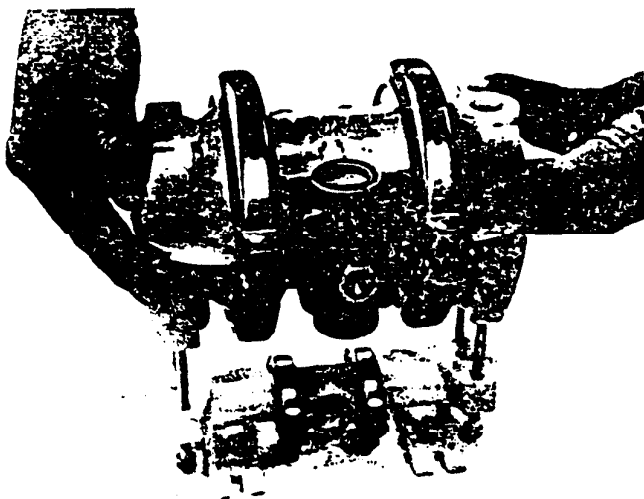


Figure 14A

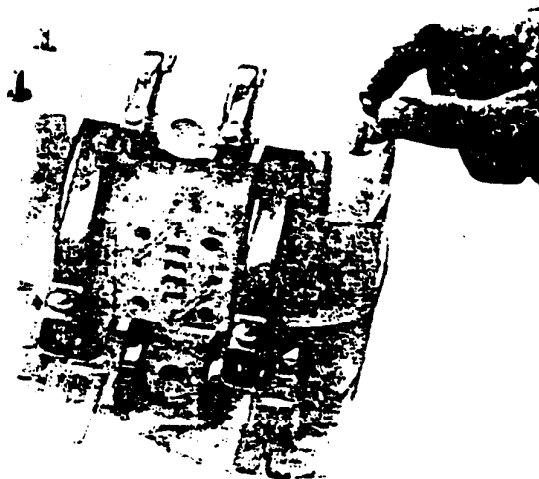


Figure 14B

Step 6.

Make sure the valve balls, valve seats, sealing O-rings, and Teflon® gaskets, if needed, are installed. Install the four long body bolts into the inlet manifold and place the main body of the pump onto the inlet housing. Place the discharge manifold on the center section. Put the washers and nuts on the bolts and tighten to approximately 100 in. lbs.

Step 7.

Retighten all clamp bands. When all maintenance and/or repairs are accomplished, an air line should be connected to the pump's air valve and the pump run dry. Be sure to blow out air line for 10 to 20 seconds before reinstalling pump in service. Good suction should be observed at the pump inlet. Approximately 15 inches of vacuum, should be observed with pumps fitted with rubber diaphragms and 10 inches with pumps fitted with Teflon® diaphragms. If pumps does not operate or pull sufficient vacuum, refer to troubleshooting section in the installation instructions that were supplied with the pump.

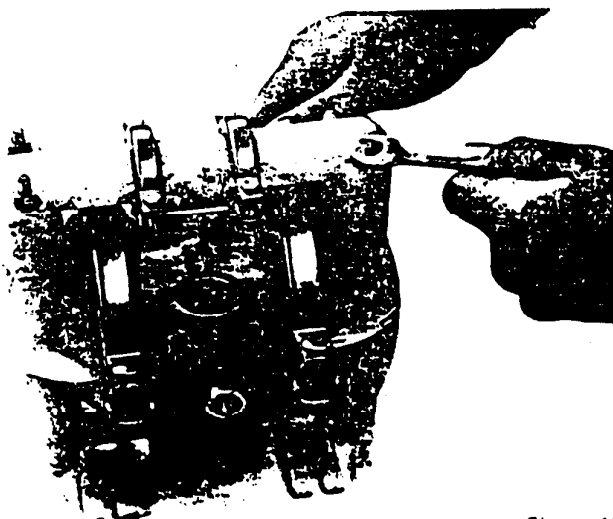


Figure 15

SECTION II

AIR VALVE/CENTER BLOCK REPAIR/MAINTENANCE

The air valve assembly consists of both the air valve body and piston and the center section. The unique design of the air valve relies only on differential pressure to cause the air valve to shift. It is reliable and simple to maintain. The bushing in the center block, along with the diaphragm shaft, provides the "trigger" to tell the air valve to shift. The following procedure will ensure that the air valve on your Wilden pump will provide long trouble-free service.

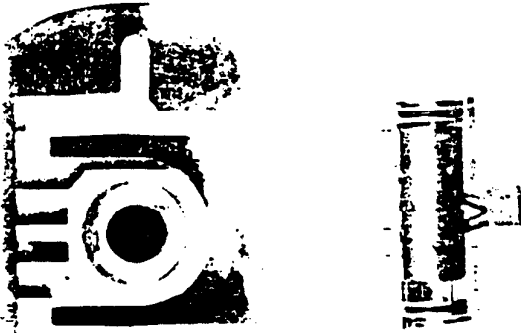
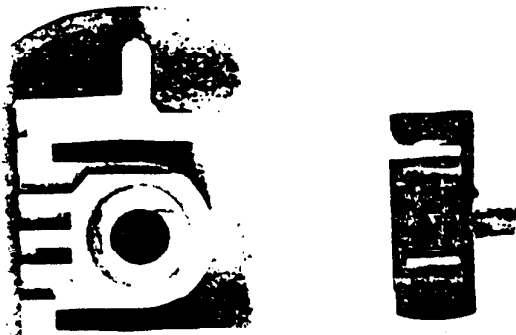


Figure A

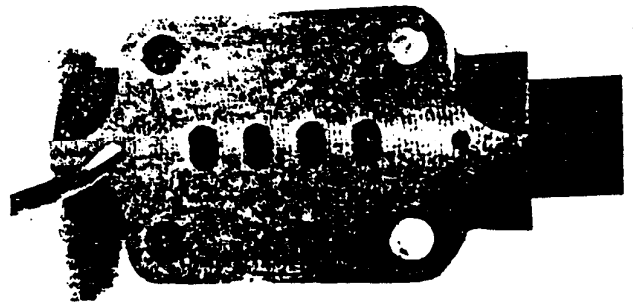


10 Figure B

AIR VALVE BODY AND PISTON ASSEMBLY AND DISASSEMBLY:

The air valve body and piston (P/N LF100A) can be disconnected from the pump by removing the four socket head cap screws which attach it to the center section (P/N P92HA). The piston in the air valve is aluminum with a dark gray anodized coating. The piston should move freely and the ports in the piston should line up with the ports on the face of the air valve body (see below). The piston should also appear to be a dull, dark gray in color. If the piston appears to be a shiny aluminum color, the air valve is probably worn beyond working tolerances and should be replaced.

Figure C



If the piston does not move freely in the air valve, the entire air valve should be immersed in a cleaning solution. (NOTE: Do not force the piston by inserting a metal object.) This soaking should remove an accumulation of sludge and grit which is preventing the air valve piston from moving freely. If the air valve piston does not move freely after the above cleaning, the air valve should be disassembled as follows: remove the snap ring from the top end of the air valve cylinder and apply an air jet to the $\frac{1}{8}$ inch hole on the opposite end of the air valve face (see Figure C). [CAUTION: The air valve end cap (P/N P100R), may come out with considerable force.] Inspect the piston and cylinder bore for nicks and scoring.

Small nicks can usually be dressed out and the piston returned to service. Inspect the cylinder end caps (P/N 100R has the piston guide pin and P/N P100S does not.) Make sure that the guide pin is straight and smooth or the piston will not move freely in the cylinder. New O-rings (P/N 100U) should be installed on the end caps. Lubricate the O-rings and install the end caps, assuring that proper alignment of the piston and cylinder ports is maintained.

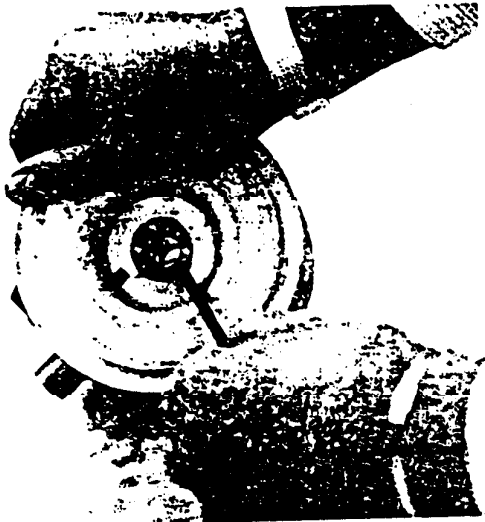


Figure D

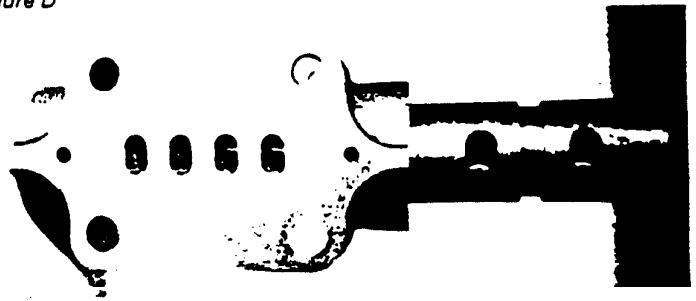
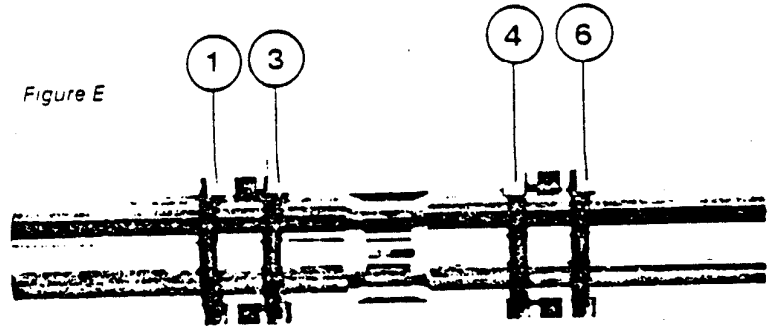


Figure E



Grooves In
Bushing Which
Contain O-Rings

Figure F

O-RING REPLACEMENT/CENTER SECTION

The pump's center section (P/N P92HA) consists of a moulded housing with a cast-in-bronze bushing. The bushing has six grooves (see *Figure E*). When the O-rings become worn or flat, they will no longer seal and must be replaced. This is most easily accomplished by using a tool called an O-ring pick (see *Figure F*), available through most industrial supply companies. Since these O-rings form a part of the shifting function of the pump, it is necessary that they be located in the proper grooves. **NOTE: THE SHAFT BUSHING IS CAST INTO THE CENTER SECTION AND IS NOT REMOVABLE.**

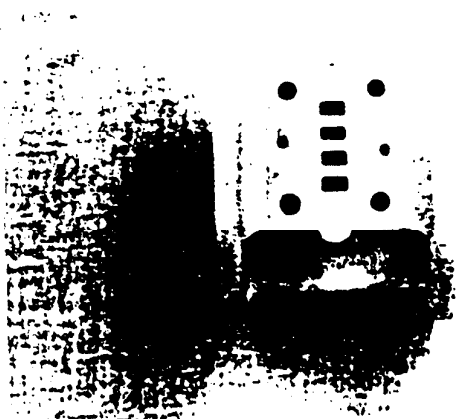


Figure G

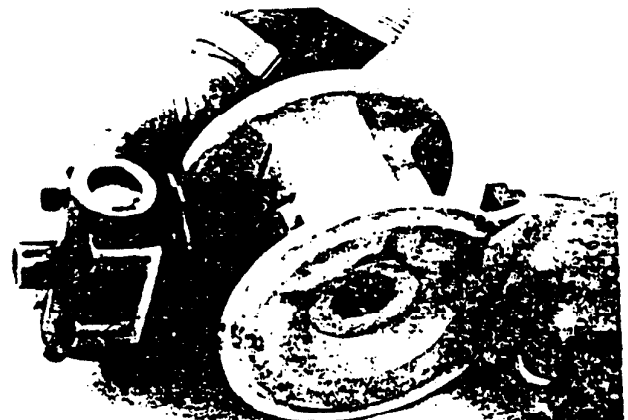
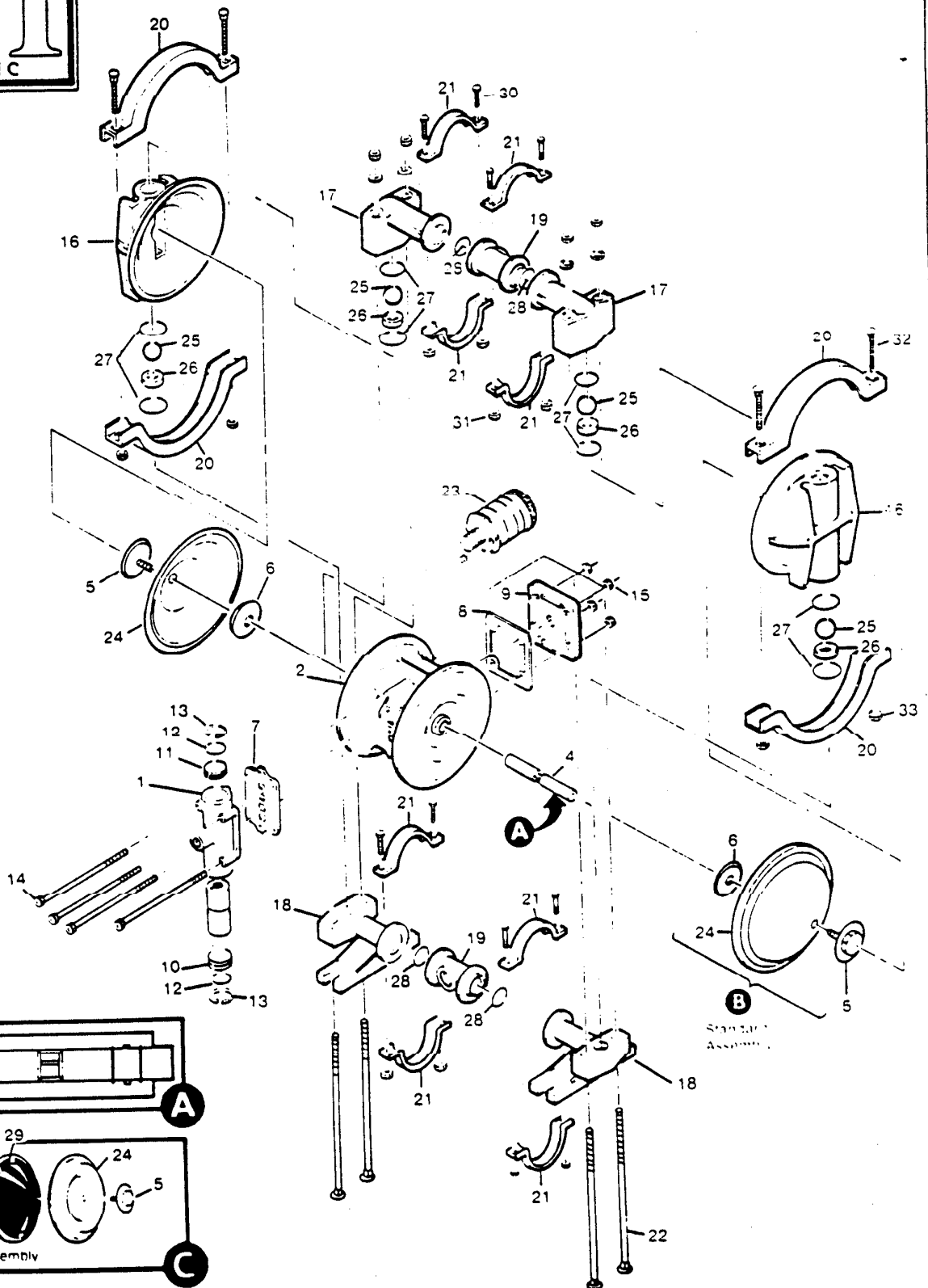


Figure H

Inspect the air valve side of the center section for flatness and to insure no nicks or other damage exists that would prevent the air valve from sealing when installed. Inspect the two channels and their ports to make sure they are clean and the ports are open to the bushing (see *Figure G*). The air valve will not shift if these ports are plugged or an O-ring is in the wrong groove of the center block closing off a port. Inspect the air valve gasket and muffler plate gasket and replace if damaged. Attach the air valve to the center section. (Tighten to 20 in. lbs.) Refer to page 6 for pump reassembly.

M1

PLASTIC



NOTE: Tellon Diaphragm Models Assembled With Tellon Gasket Kit At Factory (Not Shown)

Teflon® Fitted Pumps

Item	Description	Qty. Per Pump	M1/PT	M1/PP	M1/KT	M1/KK	M1/UO	M1/UP	M1/UH	M1/UC
			P/N	P/N	P/N	P/N	P/N	P/N	P/N	P/N
1	Air Valve Body & Piston	1	LF100A	PC100A	LF100A	PC100A	LF100A	PC100A	LF100A	PC100A
2	Center Section*	1	P92HA	←						
3	Center Block O-Ring	4	LF92JH	←						
4	Shaft	1	101A	←						
5	Pistons/Outer	2	P99B	←	K99B	←	PF99B	←		
6	Pistons/Inner	2	P99C	←						
7	Air Valve Gasket	1	100B	←						
8	Muffler Plate Gasket	1	P92MG	←						
9	Muffler Plate	1	P92M	←						
10	End Cap w/Guide	1	P100R	←						
11	End Cap w/o Guide	1	P100S	←						
12	End Cap O-Ring	2	100U	←						
13	End Cap Snap Ring	2	S90T	←						
14	Air Valve Cap Screw	4	101AS	PC101AS	101AS	PC101AS	101AS	PC101AS	101AS	PC101AS
15	Air Valve Cap Screw Nut	4	S62C	PCS62C	S62C	PCS62C	S62C	PCS62C	S62C	PCS62C
16	Water Chamber	2	P95	←	K95	←	PF95	←		
17	Discharge Manifold Elbow	2	P96	←	K96	←	PF96	←		
18	Inlet Manifold Elbow	2	P97	←	K97	←	PF97	←		
19	Manifold "T" Section***	2	P98	←	K98	←	PF98	←	PFT98	←
20	Clamp Band (Large)	2	P94	PC94	P94	PC94	P94	PC94	P94	PC94
21	Clamp Band (Small)	4	P98D	PC98D	P98D	PC98D	P98D	PC98D	P98D	PC98D
22	Vertical Bolt w/Nut, Washer	4	P104	PC104	P104	PC104	P104	PC104	P104	PC104
23	Muffler	1	70D	←						
24	Teflon® Diaphragm	2	TF93	←						
25	Teflon Valve Ball	4	TF111	←						
26	Valve Seat	4	KT110	←			PF110	←		
27	Teflon® Valve Seat O-Ring	8	TFE110B	←			TFE110BV	←		
28	Teflon® Manifold O-Ring	4	TFE98B	←			TFE98BV	←		
29	Back-up Diaphragm**	2	TF93B	←						
30	Small Clamp Band Bolt	8	S98B	PCS98B	S98B	PCS98B	S98B	PCS98B	S98B	PCS98B
31	Small Clamp Band Nut	8	S98C	PCS98C	S98C	PCS98C	S98C	PCS98C	S98C	PCS98C
32	Large Clamp Band Bolt	4	S94B	PCS94B	S94B	PCS94B	S94B	PCS94B	S94B	PCS94B
33	Large Clamp Band Nut	4	S62C	PCS62C	S62C	PCS62C	S62C	PCS62C	S62C	PCS62C

NOTE: Optional Teflon® PFA diaphragms available (P/N PFA 93)

Polyurethane Fitted Pumps

			M1/PO	M1/PC	M1/KO	M1/KC
24	Polyurethane Diaphragm	2	PU93	←		
25	Polyurethane Valve Ball	4	PU111	←		
27	Polyurethane Valve Seat O-Ring	8	PU110B	←		
28	Polyurethane Manifold O-Ring	4	PU98B	←		
29	Back-Up Diaphragm**	2	N/R	←		

NOTE:

*Includes molded-in-bronze bushing with O-rings.

**Required only for Teflon® diaphragm models.

***Models UH and UC have a 1/2" X 2 1/4" male non-threaded "T" section (P/N PFT98).

Coated Parts (Available for all models)

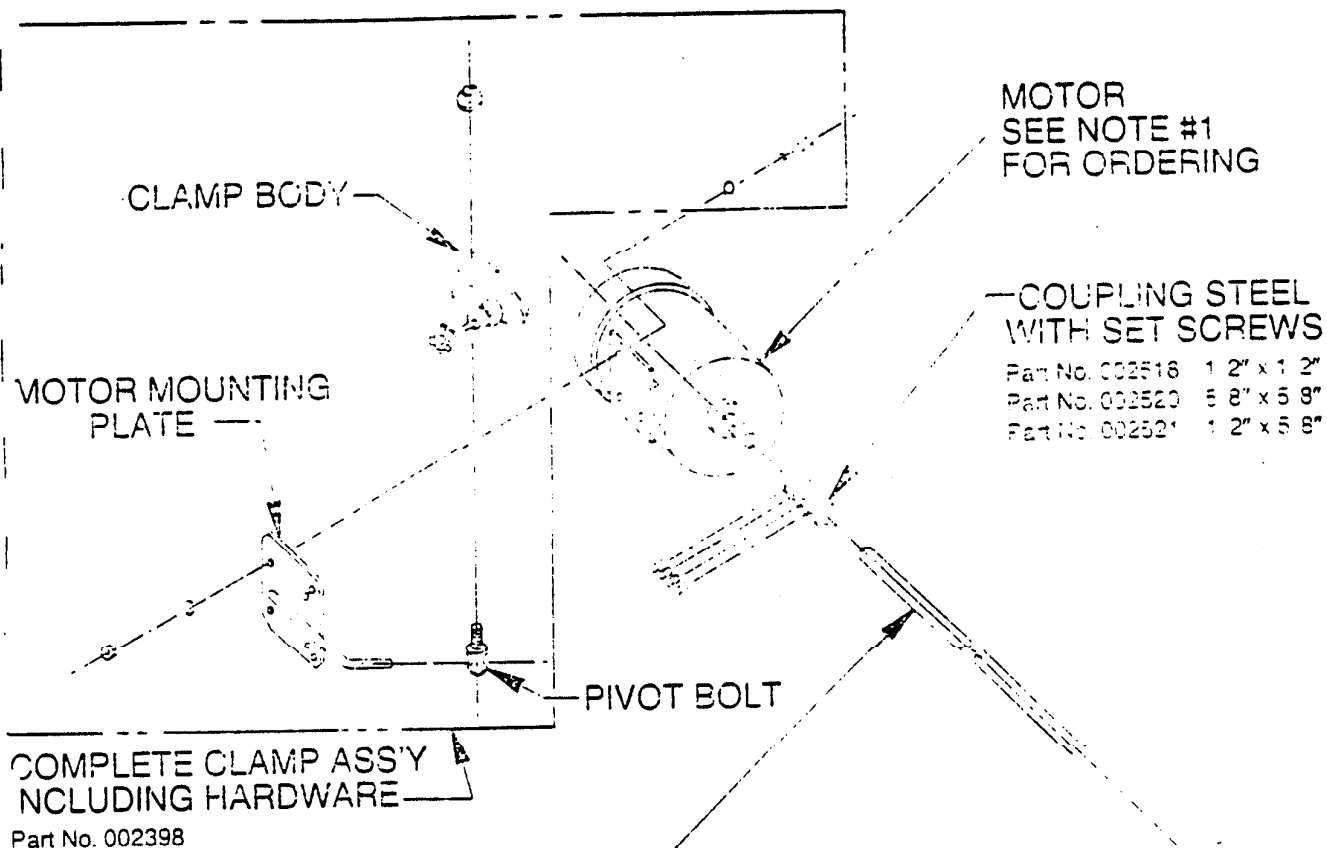
			M1/PC	M1/PP	M1/KC	M1/KK	M1/UP	M1/UC
1	Air Valve Assembly	1	PC100A	←				
14	Air Valve Cap Screw	4	PC101AS	←				
15	Air Valve Cap Screw Nut	4	PCS62C	←				
20	Clamp Band (Large)	2	PC94	←				
21	Clamp Band (Small)	4	PC98D	←				
22	Vertical Bolt w/Nut, Washer	4	PC104	←				

NOTE: Models with coated hardware standard with end cap cover (P/N P100C).

NOTE #1

WHEN ORDERING A REPLACEMENT MOTOR:

- A. Electric motor, specify motor characteristics and Model No.
- B. Air motor, specify Model No.



SHAFT 32" STANDARD

Part No. 000510	1 2" Dia.	304SS
Part No. 000507	1 2" Dia.	316SS
Part No. 000709	1 2" Dia.	C-20
Part No. 000565	5 8" Dia.	304SS
Part No. 000563	5 8" Dia.	316SS
Part No. 000564	5 8" Dia.	C-20

4" PROPELLER WITH SET SCREW

Part No. 000513	1 2" Bore.	304SS
Part No. 000514	1 2" Bore.	316SS
Part No. 000515	1 2" Bore.	C-20
Part No. 000536	5 8" Bore.	304SS
Part No. 000539	5 8" Bore.	316SS
Part No. 000540	5 8" Bore.	C-20

TO ORDER PARTS

- 1) Send Order To:
Neptune Mixer Co.
P.O. Box 247
Lansdale, Pa. 19446
Phone 215-699-8701
Fax 215-699-0370
- 2) Order Must Include
 - A) Mixer Model Number
 - B) Part Number

NEPTUNE MIXER CO.		
LANSDALE		PENNA. 19446
ASSEMBLY SHEET AND PARTS LIST		
MODELS A-1.0 THROUGH B-4.0		
DRAWN BY	DATE	DWG NO.
	1-7-89	105819

INSTALLATION AND MAINTENANCE INSTRUCTIONS

(SEE REVERSE SIDE FOR PARTS LIST)

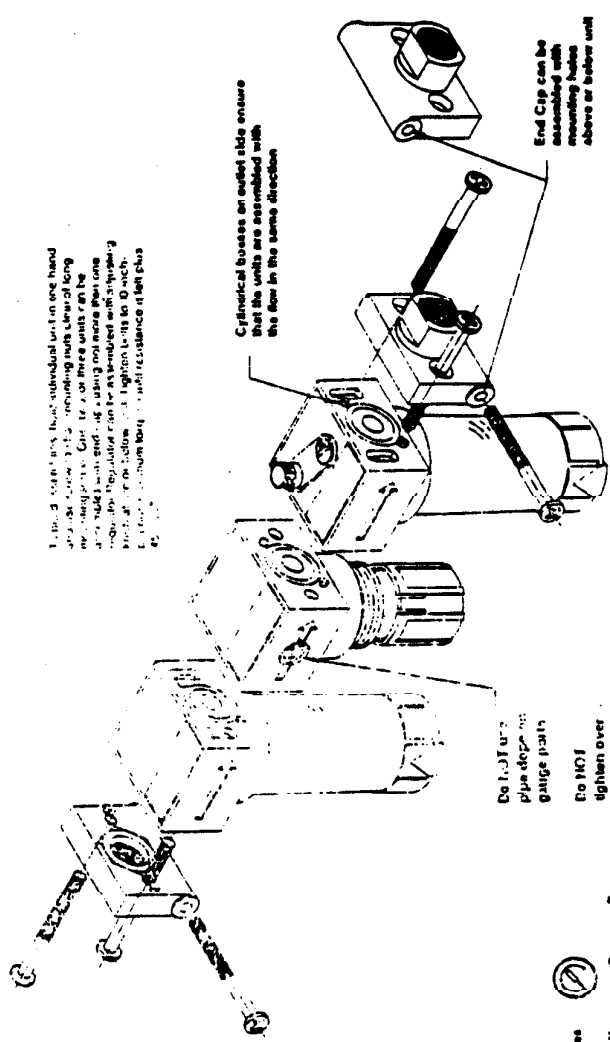
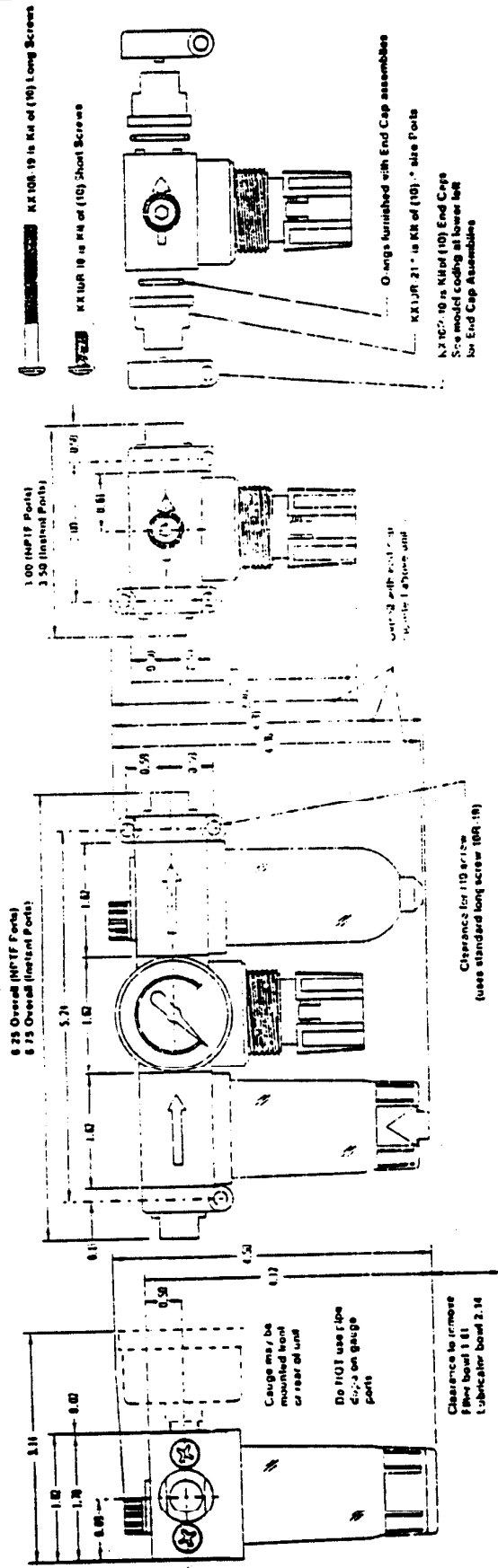


Table 3: Standard built-in standard unit in one hand and the other hand. The unit is not to be used on gauge ports. The unit is not to be used on gauge ports. The unit is not to be used on gauge ports.

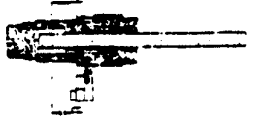
F 10 - 1 5

Product Part	Product	Standard Options	Q'ty	Notes
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10	Filter	Regulator	1.5	50 Element
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10	0.50psi Spring			
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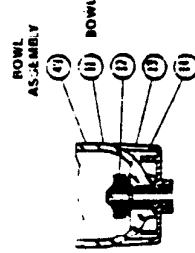
MODEL L10 Adjustable Wick Lubricator



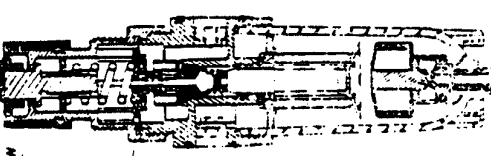
SECTION A-A



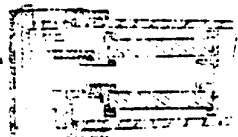
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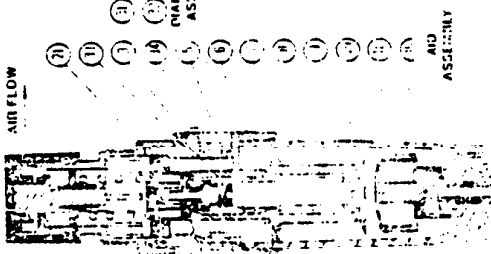
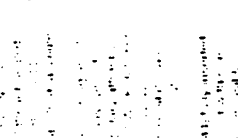
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MODEL FC10
MODEL CF10
MODEL CF11
MODEL LD10
Manual Draft



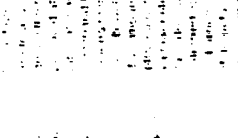
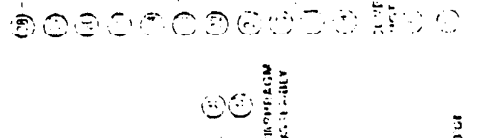
MODEL CFSH
Combination Filter
Capillary Separator



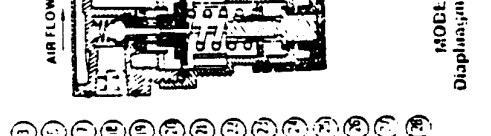
MODEL FC 10
Coal-Fired Filler

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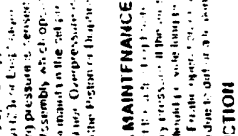
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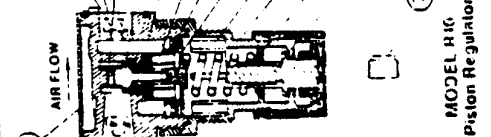
CONTENTS



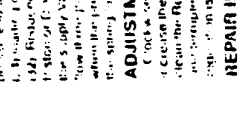
...but the fact is that...



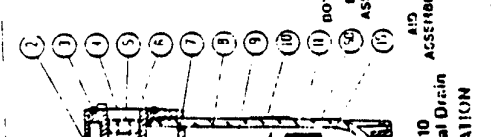
of a 100% increase in the



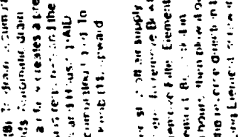
110 & 111 REGIONAL OPERATIONS



of 8504 in 1980.



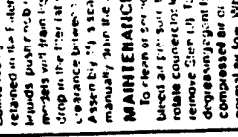
the (i)



1977-78: 1000
1978-79: 1000
1979-80: 1000



ATTENTION



gap and water of the

• **Exercise:** 10-15 min. Use Cleftonly early 1st
 and 2nd rounds, end of 3rd round, 4th round
 and 5th round. Use Cleftonly early 1st
 and 2nd rounds, end of 3rd round, 4th
 round and 5th round. Use Cleftonly
 early 1st and 2nd rounds, end of 3rd
 round, 4th round and 5th round. Use
 Cleftonly early 1st and 2nd rounds, end
 of 3rd round, 4th round and 5th round.

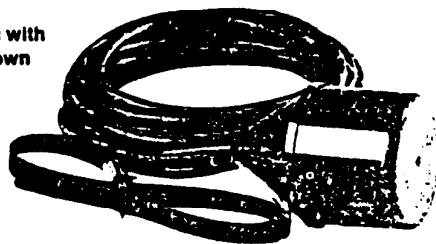
the 1990s, the proportion of the population aged 65 and over has increased from 12.5% to 16.5% and is projected to reach 20.5% by 2020. The proportion of the population aged 75 and over has increased from 4.5% to 6.5% and is projected to reach 9.5% by 2020. The proportion of the population aged 85 and over has increased from 1.5% to 2.5% and is projected to reach 4.5% by 2020. The proportion of the population aged 95 and over has increased from 0.5% to 1.0% and is projected to reach 2.0% by 2020. The proportion of the population aged 100 and over has increased from 0.1% to 0.2% and is projected to reach 0.5% by 2020.

assumed to be fixed (15), and may be regarded as a 2nd order effect, which can be represented by the CIGMA value. The following table shows the results of the regression analysis. The first three columns are the variables used by the regression model. The last column is the CIGMA value. The first three columns are the variables used by the regression model. The last column is the CIGMA value.

[illegible]

A quality mercury float designed to activate pump control panels, solenoids, relays, etc.

Standard Model with
Pipe Clamp Shown



Three models available:

- **Standard** - Accurately monitors liquid levels. UL Listed for water and sewage, and CSA Certified.
- **Mini** - Compact float housing for confined areas. UL Listed for water and sewage, and CSA Certified.
- **NO/NC** - Standard switch features that can be wired as Normally Open or Normally Closed. UL Listing and CSA Certification pending.

DESCRIPTION

Three ordering options provide for flexibility in installation.

PC (Pipe Clamp): The PC is not weighted, and is installed by strapping the pipe clamp at the desired activation level to a discharge pipe or other similar mounting.

WI (Weight, Internal): This option is used in applications where the float is suspended from above. The WI is not available in the Mini-Sensor model.

WE (Weight, External): The WE has an adjustable weight attached to the cable and is used in applications where the float is suspended from above.

ADVANTAGES

- Heavy-duty mercury tilt switch is epoxy encapsulated in non-corrosive PVC plastic float housing.
- **TWO-YEAR LIMITED WARRANTY.**

APPLICATIONS

Sensor Floats are frequently used in sewage systems, irrigation systems, and in other water systems.

NORMALLY OPEN (Pump down)

application: The mercury float switch closes (turns on) when the float tips a few degrees above the horizontal position and opens (turns off) when the float drops a few degrees below the horizontal position.

NORMALLY CLOSED (Pump up)

application: The mercury float switch closes (turns on) when the float drops a few degrees below the horizontal position and opens (turns off) when the float tips a few degrees above the horizontal position.

	Standard	NO/NC	Mini
CORD: SJOW-A (UL), SJOW (CSA)	Flexible 16 gauge, 2 conductor, water-resistant Neoprene.	Flexible 16 gauge, 3 conductor, water-resistant Chlorinated Polyethylene (CPE).	Flexible 16 gauge, 2 conductor, water-resistant Neoprene.
FLOAT HOUSING: thick-wall, high impact resistant, non-corrosive PVC plastic for use in liquids up to 140°F (60°C).	3.38 inch (8.58 cm) diameter x 4.55 inch (11.56 cm) long.	3.38 inch (8.58cm) diameter x 4.55 inch (11.56 cm) long.	2.81 inch (7.14 cm) diameter x 3.42 inch (8.68 cm) long.
MERCURY TILT SWITCH:	Single pole, single throw, mercury-to-mercury contacts.	Single pole, double throw, mercury-to-mercury contacts.	Single pole, single throw, mercury-to-metal contacts.
ELECTRICAL:	13 Amp 120VAC or 230VAC	13 Amp 120VAC or 230VAC	13 Amp 120VAC or 230VAC

MODEL

DEFINITION:

Examples: 15PCNC
15SWINO/NC
15MWENO

15

Cord Length (FT)
Available
10, 15, 20,
30, 40, 50

S or M

Standard
or
Mini

WE, WI, or PC

Weight External,
Weight Internal*,
Pipe Clamp

N.O., N.C. or N.O/N.C.

Normally Open,
Normally Closed,
Normally Open/ Normally Closed*

*Note: Mini not available with Internal Weight or NO/NC options.

SENSOR FLOAT® Installation Instructions

Figure A

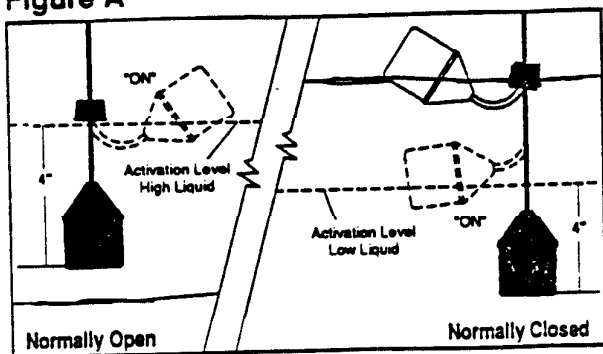


Figure B

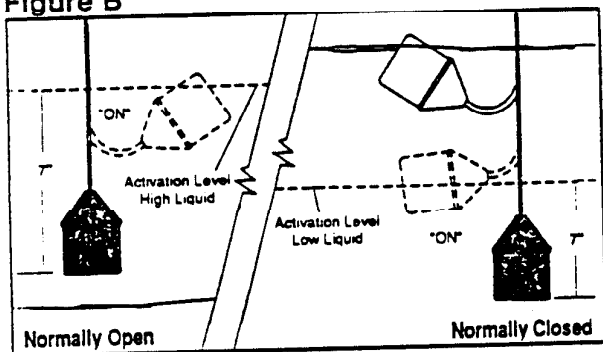
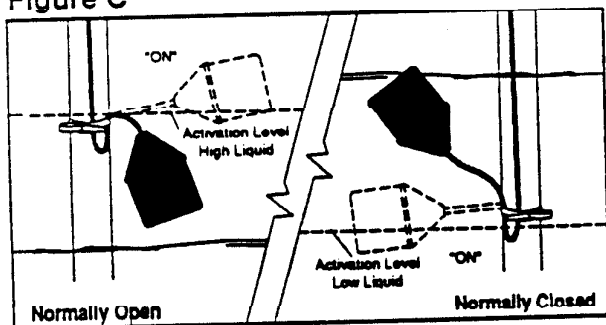


Figure C



WARNING: Turn off power source before installing or adjusting this device. Failure to turn off power could result in serious or fatal electrical shock.

1. Read these instructions carefully.
2. Check your local codes before installing. We recommend this product be installed in accordance with national and local electrical codes.
3. Do not wire this product while you are standing on a wet or damp surface.
4. Do not remove cord label from switch unit.

WE (Weight, External) Figure A

1. Determine activation level.
2. Suspend externally weighted Sensor Float control switch 4" below determined activation level. See illustration.
3. Wire Sensor Float cable directly into control device. For Normally Open/Normally Closed models see FIG. 1 and FIG. 2.

WI (Weight, Internal) Figure B

1. Determine activation level.
2. Suspend internally weighted Sensor Float control switch 7" below determined activation level. See illustration.
3. Wire Sensor Float cable directly into control device. For Normally Open/Normally Closed models see FIG. 1 and FIG. 2.

Note: The SWI remains partially submerged during the "on" tipping action. See Figure B.

PC (Pipe Clamp) Figure C

1. Determine activation level.
2. Strap Sensor Float control switch to discharge pipe or similar mounting at determined activation level. See illustration. The activation level may be adjusted by moving the pipe clamp up or down on the discharge pipe.
3. Wire Sensor Float cable directly into control device. For Normally Open/Normally Closed models see FIG. 1 and FIG. 2.

Clamp Detail

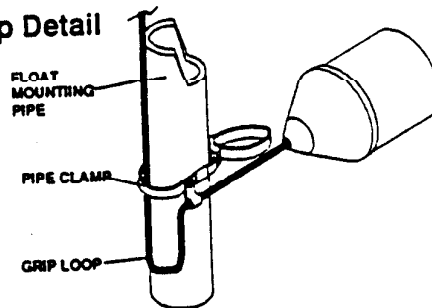
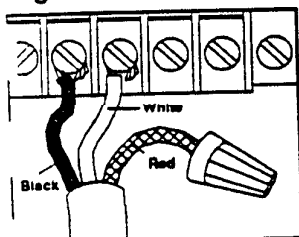
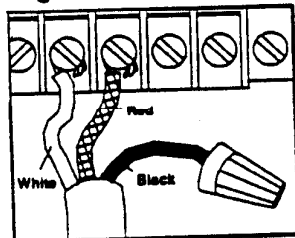


Figure 1 - N.O. Wiring



Wire the black and white conductors directly to the control device. Insulate the red wire with tape or wire nut.

Figure 2 - N.C. Wiring



Wire the red and white conductors directly to the control device. Insulate the black wire with tape or wire nut.

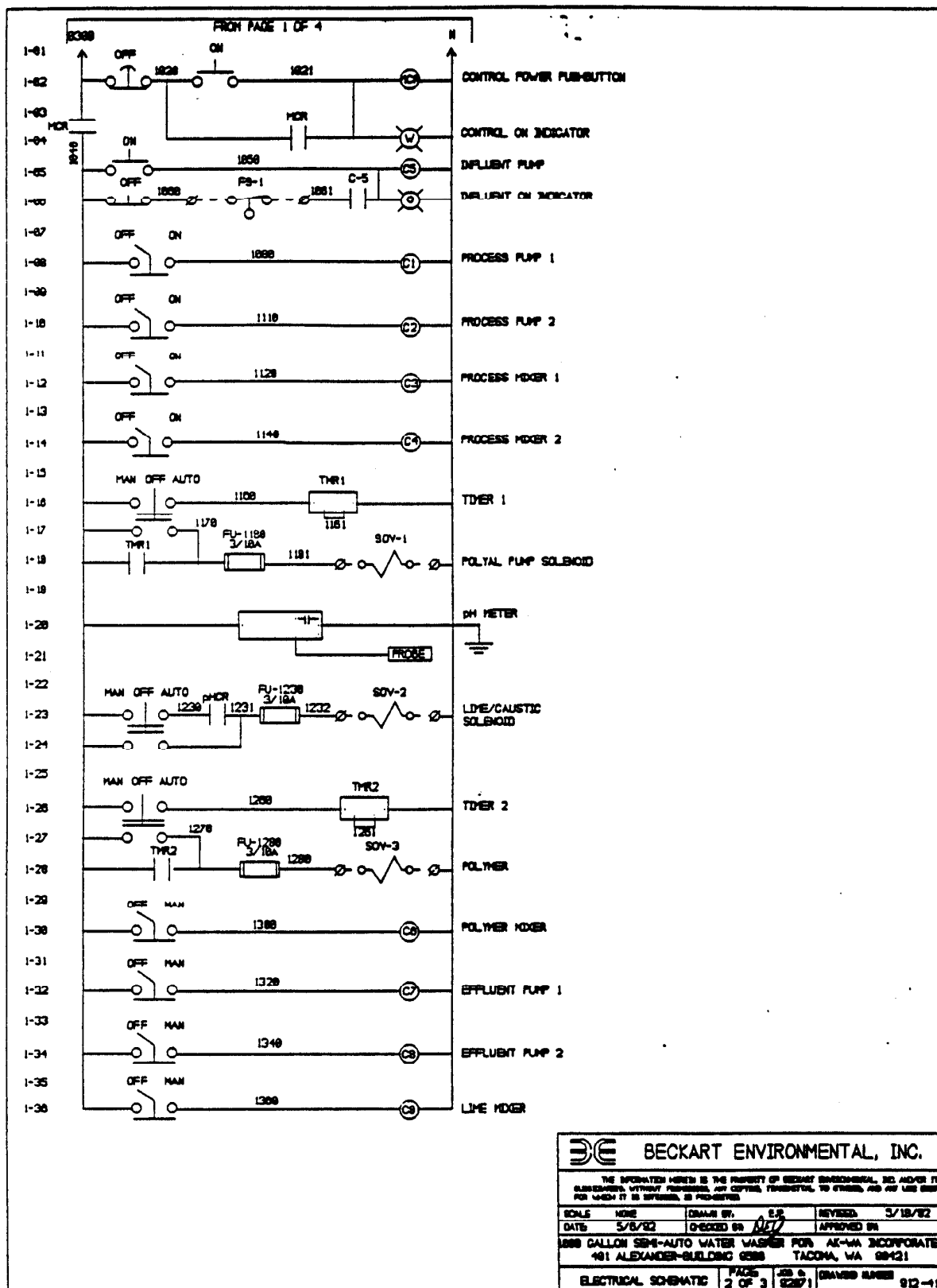


S.J. ELECTRO SYSTEMS, INC.

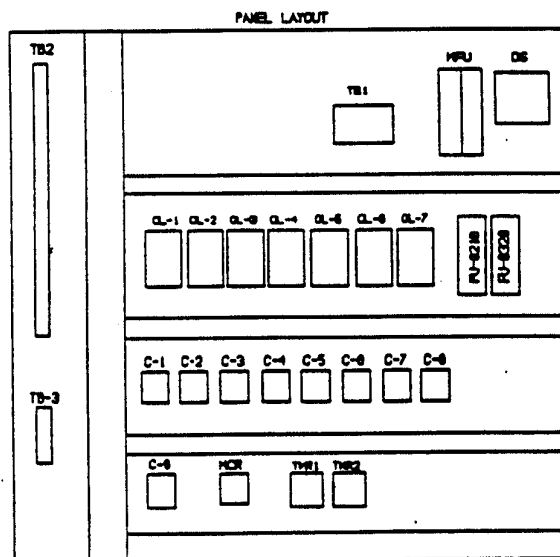
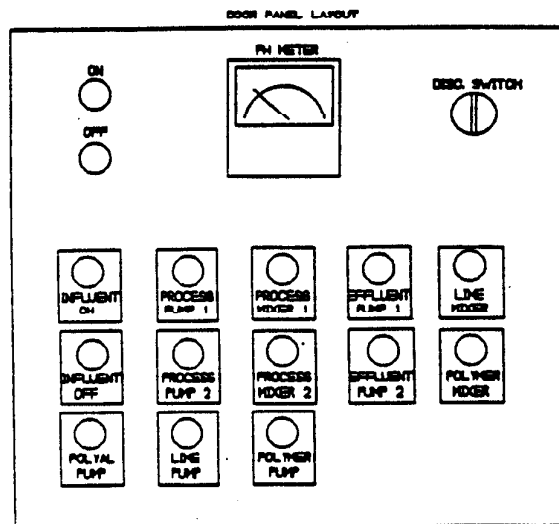
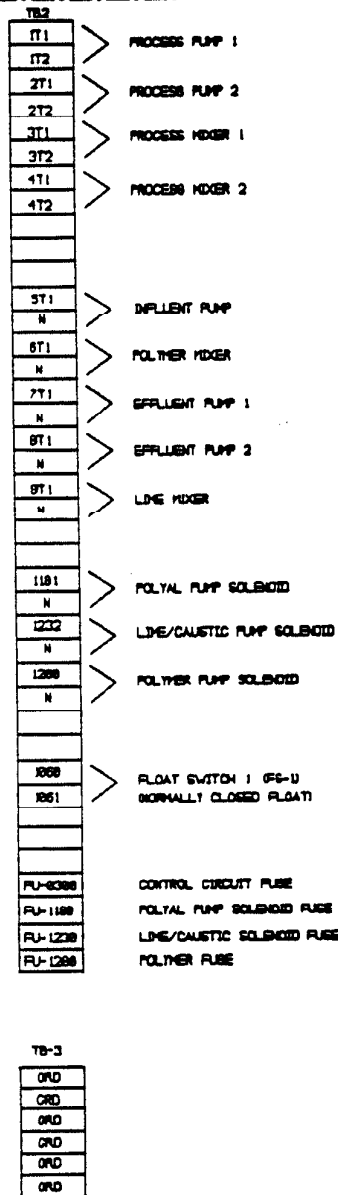
Built with Pride - Employee Owned
PO Box 1619 County Rd 6 Detroit Lakes, MN 56502



Cat. Pg. L10014A
1001214A

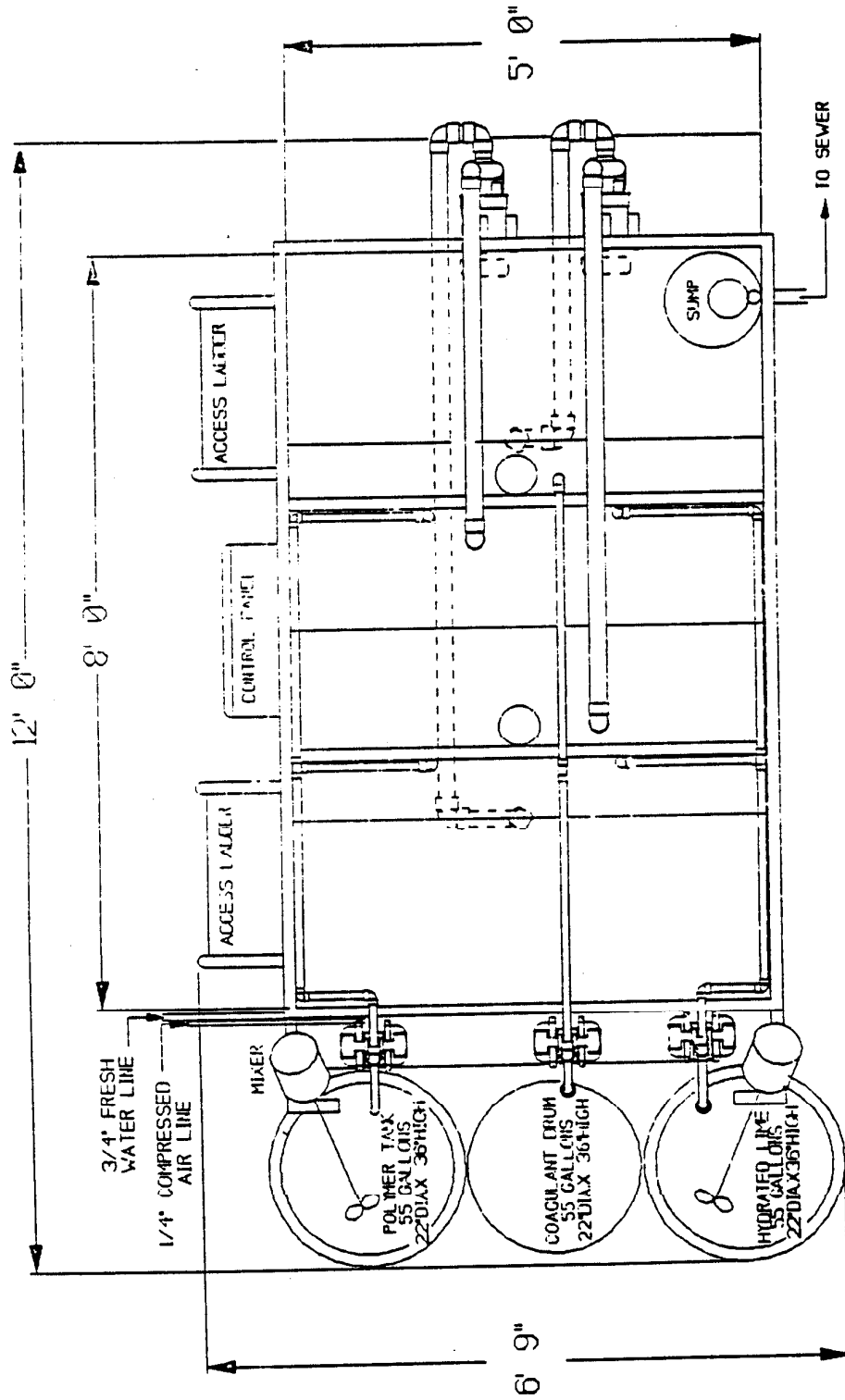


TERMINAL BLOCKS FOR FIELD CONNECTIONS



ENCLOSURE 34" X 24" X 8"

BECKART ENVIRONMENTAL, INC.			
<small>THE INFORMATION HEREIN IS THE PROPERTY OF BECKART ENVIRONMENTAL, INC. AND ITS SUBSIDIARIES. WITHOUT PERMISSION, ANY COPIES TRANSMITTAL TO OTHERS, AND ANY USE THEREOF FOR WHICH IT IS INTENDED, IS PROHIBITED.</small>			
SCALE	NONE	DRAWN BY	REVISED
DATE	5/8/82	CHECKED BY	APPROVED BY
1000 GALLON SERVO-AUTO WATER WASH FOR AK-11A INCORPORATED 101 ALEXANDER BUILDING SEAS TACOMA, WA 98421			
FIELD WORKS & PANEL LAYOUT	PAGE 3 OF 3	JOB # 52071	DRAWING NUMBER 812-03



1000 GALLON SEMI-AUTOMATIC "WATER WASHER"
EQUIPMENT LAYOUT PLAN

BE BECKART ENVIRONMENTAL, INC.

1000SAW2-P

TROUBLE SHOOTING (Polval 201 and Polymer B40)

A jar test can be performed to determine the amount of chemicals required to "break" the emulsion, so that the wastewater can be treated. The following test kit is provided in order to determine proper treatment:

pH paper 1 to 11
Polyal-201 solution in a dropper bottle
Caustic 10% solution in dropper bottle
Polymer B40
Graduated cylinder and stirring rod

The 10% caustic solution is used to estimate the lime usage as lime does not stay in solution that well. In general, the proper pH range to break emulsions is 7.0 - 7.5. The whole object is to get enough Polyal-201 in the sample to take charges off the particulates, and since alum reduces the pH, caustic will raise the pH so that the proper pH level can be maintained. When a "grainy" look to the wastewater has been attained, it means that the proper chemical level has been reached. The addition of the polymer will cause the "floc" in the graduated cylinder.

The drops of each chemical added should be counted, as the accompanying chart will be used to determine chemical addition to the treatment tank.

- 1) Fill graduated cylinder with wastewater to be treated to the 100 ml mark.
- 2) Add enough Polyal-201 and caustic to cause a grainy condition, mix well, check pH.
- 3) Add polymer, shake or stir vigorously.

POLYMER ADDITION:

The polymer should be added to the treatment tank only after the proper pH range has been attained. Also, do not add polymer until at least two minutes after the lime addition has occurred, so that the lime has had enough time to go into solution.

NEEDLE VALVES:

Make sure the air valves are open so that when the process pumps are operating air is being sucked through the pumps through the air lines. The micro-bubbles allow the floc to rise and be floated for more efficient filtering.

INTAKE BALL VALVES (with red handles):

The ball valves should be open while the system is in operation. The red handle on the ball valve should be in line with the piping to the process pump. Should more micro-bubbles be required, the ball valves should be slightly closed to suck more air through the process pumps. Be careful not to close the ball valve too much as it will cavitate the process pump. The ball valve should never be closed more than 10%.

GENERAL MAINTENANCE

CHEMICAL STORAGE:

The Polyal-201 and hydrated lime should be stored in labeled containers and covered. A scoop should be provided for weighing out the required amounts of chemicals. The B40 polymer should be kept in a dry place and kept covered.

CLEANING VIEWING TUBES:

The viewing tubes should be cleaned periodically to remove the dirt and oils which have been accumulated on the sides of the viewing tubes. Soapy water and a long handled brush will clean the viewing tubes. A plug can be removed at the top of each viewing tube which allows you to clean the tubes properly.

SLUDGE ACCUMULATION IN TREATMENT TANK:

The last portion of sludge in the treatment tank should be squeezed into the sludge trays for dewatering after each treatment to avoid any accumulation of sludge.

PRICE LIST FOR SUPPLIES:

Polyal-201.....	\$ 195.00/55 gal. drum
4 to 9 drums.....	\$ 175.00/55 gal. drum
10 to 24 drums.....	\$ 145.00/55 gal. drum
25 or more drums.....	\$ 135.00/55 gal. drum
 B-40 polymer.....	 \$ 175.00/5 gallons
 Hydrated lime.....	 \$.22 lb/50 lb. bags
 Filter paper 48" roll.....	 \$ 115.00/roll
 pH paper.....	 \$ 15.50/roll
 Pump seal kit.....	 \$ 22.00 ea
 100 ml graduated cylinder - plastic.....	 \$ 7.00 ea
 Dropper bottle.....	 \$ 2.00 ea

AK-WA INC.

TACOMA, WA

SPARE PARTS LIST:

WILDEN M1/PO/PU/PU/KU AIR OPERATED PUMP

<u>PART #</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>PRICE</u>
PU93	Diaphragm	2	\$ 6.00 ea
01-1080-50	PU Ball	4	\$ 1.60 ea
KT110	Seat	4	\$ 3.20 ea
01-1200-50	O-Ring	8	\$.40 ea
01-6320-50	Manifold O-Ring	4	\$.40 ea
92JH	O-Ring	4	\$.40 ea
100B	Gasket	1	\$.80 ea
P92MG	Gasket	1	\$.80 ea
100U	O-Ring	2	\$.40 ea
UUKU1P	Entire Kit of above parts	1	\$ 40.00 ea

WILDEN M1/PT/TF/TF/KT AIR OPERATED PUMP

<u>PART #</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>PRICE</u>
TF93B	Backup Diaphragm	2	\$ 7.20 ea
TF93	Diaphragm	2	\$ 56.00 ea
TF111	Ball	4	\$ 3.60 ea
KT110	Seat	4	\$ 3.20 ea
TFE110B	O-Ring	8	\$ 3.36 ea
TFE98B	O-Ring Manifold	4	\$ 3.36 ea
92JH	O-Ring	4	\$.40 ea
100B	Gasket	1	\$.80 ea
P92MG	Gasket	1	\$.80 ea
100U	O-Ring	2	\$.40 ea
TF1GK	Kit	1	\$ 12.80 ea
TTKT1P	Entire Kit of above parts	1	\$210.72 ea

PROCESS PUMP MODEL #ZM-53

<u>PART #</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>PRICE</u>
101.000.110	Seal, Buna/Ceramic	3	\$ 21.00 ea

PROCESS PUMP MODEL #SM-51

<u>PART #</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>PRICE</u>
101.000.110	Seal, Buna/Ceramic	3	\$ 21.00 ea

NEPTUNE MODEL B3.0 MIXER

<u>PART #</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>PRICE</u>
B3.2	Replacement Mixer	1	\$300.00 ea

GREAT LAKES INSTRUMENTS SUBMERSIBLE pH PROBE MODEL #6028PO
AND pH ANALYZER/METER, MODEL #671
AND SUPPLIES

<u>PART #</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>PRICE</u>
60A2A4908	Salt Bridge	1	\$ 27.00 ea
25MIA1001			
115	Cell Buffer	1 pt	\$ 14.40 ea
	pH Paper	1	\$ 15.50 ea
	pH 7 Calibration Buffer	1 qt	\$ 18.00 ea
	pH 4 Calibration Buffer	1 qt	\$ 18.00 ea
	pH 10 Calibration Buffer	1 qt	\$ 18.00 ea
6028PO	pH Probe	1	\$525.00 ea
671P1C1GON	pH analyzer/meter	1	\$635.00 ea

AK-WA, INC.

MARCH, 1993
REVISED SEPTEMBER, 1993

PART III C, MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheet

Date last revised _____

I. General Information

Chemical Name & Synonyms Polyal-201	Trade Name & Synonyms Matal salt
Chemical Family ACID	Formula AlCl₃
Proper DOT Shipping Name Aluminum Chloride Solution	DOT Hazard Classification Corrosive
Manufacturer Beckart Environmental	Manufacturer's Phone Number (312) 949-4790 414/656-7680
Manufacturer's Address 819 E. Orchard, Mundelein, IL 60060	Chemtrec Phone Number

II. Ingredients

Principal Hazardous Components	Percent	Threshold Limit Value (units)
Aluminum Chloride CAS# 7446-70-0	25-36%	N/A
Hydrogen Chloride CAS# 7647-01-0	2.0%	N/A
Non-Hazardous Components		
Water CAS# 7732-18-5	75-64%	N/A

III. Physical Data

Boiling Point (°F) 250°F	Specific Gravity (H ₂ O = 1) 1.299-1.318
Vapor Pressure (mm Hg.) N/A	Percent Volatile By Volume (%) N/A
Vapor Density (Air = 1) N/A	Evaporation Rate (_____ = 1) N/A
Solubility in Water Complete	pH 1.
Appearance & Odor Odorless to chlorine - colorless to yellow-green	

IV. Fire & Explosion Hazard Data

Flash Point (Test Method) Not flammable	Auto Ignition Temperature N/A
Flammable Limits N/A	LEL N/A
Extinguishing Media N/A	UEL N/A
Special Fire Fighting Procedures None	

EXHIBIT 3

Unusual Fire & Explosion Hazards _____

V. Health Hazard Data

OSHA Permissible Exposure Limit

N/A

Chinogen - NTP Program

N/O

ACGIH Threshold Limit Value

N/A

Carcinogen - IARC Program

NO

Symptoms of Exposure

Pain, inflammation, difficulty breathing

Medical Conditions Aggravated By Exposure

N/A

Primary Route(s) of Entry

Inhalation, skin, ingestion

Emergency First Aid

Skin or eye contact - immediately flush with large amounts of water, remove to fresh air.

VI. Reactivity Data

Stability

Unstable
Stable

Conditions To Avoid

Avoid contact with basic materials

Incompatibility

Materials To Avoid

Corrosive to metals. Avoid contact with basic compounds

Hazardous

May Occur

Conditions To Avoid

Polymerization

Will Not Occur

Hazardous Decomposition Products

Hydrogen chloride

VII. Environmental Protection Procedures

Spill Response

Neutralize small spills with 5% Na_2CO_3 . Flush area with large amount of water. Dike spill to prevent spread.

Waste Disposal Method

Dispose using appropriate neutralization techniques. Use approved hazardous waste treatment facility if and when necessary.

VIII. Special Protection Information

Eye Protection

Chemical safety goggles

Skin Protection

Rubber gloves

Respiratory Protection (Specific Type)

Acid vapor cannister

Ventilation Recommended

"Adequate" Ventilation

Other Protection

Rubber suit, eye wash, safety shower

IX. Special Precautions

Hygienic Practices In Handling & Storage

Corrosive material, use rubber gloves, suit, safety glasses, face shield as needed. Store in appropriate, corrosion proof tanks.

Precautions For Repair & Maintenance Of Contaminated Equipment

Wash thoroughly before repair and/or maintenance.

Other Precautions

Wash thoroughly with soap and water after use.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing,
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1017)

SECTION I

MANUFACTURER'S NAME Marblehead Lime Company		EMERGENCY TELEPHONE NO. (312) 263-4490
ADDRESS (Number, Street, City, State, and ZIP Code) 300 West Washington, Chicago, Illinois 60606		
CHEMICAL NAME AND SYNONYMS Calcium Hydroxide (Hydrated or Slaked Lime)		TRADE NAME AND SYNONYMS C.P. (Chemically Pure) Hydrate
CHEMICAL FAMILY Alkaline Earth	FORMULA Ca(OH)₂	

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS N.A. (Not Applicable)			BASE METAL N.A.		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	51620P	SPECIFIC GRAVITY (H ₂ O=1)	2.94
VAPOR PRESSURE (mm Hg.)	N.A.	PERCENT VOLATILE BY VOLUME (%)	25% Max @ 5400C
VAPOR DENSITY (AIR=1)	N.A.	EVAPORATION RATE (H ₂ O=1)	N.A.
SOLUBILITY IN WATER	Negligible		
APPEARANCE AND ODOR	White Powder - No Odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	N.A.	FLAMMABLE LIMITS	N.A.	LEL	UEL
EXTINGUISHING MEDIA	N.A.				
SPECIAL FIRE FIGHTING PROCEDURES	Noncombustible - unlike quicklime, hydrated lime will not generate heat when in contact with water.				
UNUSUAL FIRE AND EXPLOSION HAZARDS	None				

SECTION V • HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

5 mg/M³, ACGIH-1983

EFFECTS OF OVEREXPOSURE

INHALATION: Moderate upper respiratory irritant. EYE and SKIN: Causative chemical burns.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove person to fresh air. EYE and SKIN: Flush immediately with water - get medical attention. INGESTION: Give large quantities of water, do not induce vomiting - get medical attention.

SECTION VI • REACTIVITY DATA

STABILITY

UNSTABLE

X

CONDITIONS TO AVOID

Uncontrolled contact with

STABLE

acidic compounds.

INCOMPATIBILITY (Materials to avoid)

Acidic compounds.

HAZARDOUS DECOMPOSITION PRODUCTS

None

HAZARDOUS POLYMERIZATION

MAY OCCUR

WILL NOT OCCUR

X

CONDITIONS TO AVOID

SECTION VII • SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Use normal clean-up procedures.

Sweep, shovel, or vacuum.

WASTE DISPOSAL METHOD

Dispose at any approved solid waste disposal site.

SECTION VIII • SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

Use NIOSH/MSHA approved dust and/or mist respirator if dust is generated.

VENTILATION

Local and/or general ventilation is recommended if threshold limit value is exceeded.

PROTECTIVE GLOVES

Work gloves to prevent skin contact.

EYE PROTECTION

Wear goggles if possibility of eye contact.

OTHER PROTECTIVE EQUIPMENT

Wear clothing to fully protect skin from contact.

SECTION IX • SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep product dry. Avoid excessive dust generation.

OTHER PRECAUTIONS

If there is any possibility of eye or skin contact, a supply of clean water should be available to flush affected area.

PART IV, APPENDICES

- A) TEST RESULTS ON RAW WASTEWATER**
- B) TEST RESULTS ON TREATED WASTEWATER**
- C) PLANT OPERATING INSTRUCTIONS**
- D) PLAN DRAWING (BACK POCKET)**

AK-WA, INC.

MARCH, 1993
REVISED SEPTEMBER, 1993

APPENDIX 'A'
TEST RESULTS ON RAW WASTEWATER

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME AK-WA, INC.

ADDRESS 401 ALEXANDER - BLDG. 9588

TACOMA, WA, 98421

FACILITY SAME

LOCATION

WA - 004014 - 2

PERMIT NUMBER

MONITORING PERIOD

FROM 91 08 01 TO 91 10 31

HYDROBLASTING REPORT

1 ST QTR

QUALITY OR CONCENTRATION (17-19)

NOTE: Read instructions before completing this form.

PARAMETER (12-13)	QUANTITY OR LOADING (14-16)			QUALITY OR CONCENTRATION (17-19)			NO. EX (62-63)	FREQUENCY OF ANALYSIS (64-65)	SAMPLI TYPE (69-70)
	AVERAGE (46-53)	MAXIMUM (51-61)	UNITS	AVERAGE (46-53)	MINIMUM (48-49)	MAXIMUM (49-61)			
OIL AND GREASE (MG/L)	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
TOTAL SUSPENDED SOLIDS (MG/L)	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
TR COPPER (UG/L)	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
TR ZINC (UG/L)	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
TR LEAD 9UG/L)	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
DISSOLVED COPPER (UG/L)	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND FOUND THAT THE INFORMATION SUBMITTED HEREIN, AND BASED THEREON, IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (Penalties under these statutes may include fines up to \$100,000 and/or maximum imprisonment of between 6 months and 3 years.)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

DATE

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER

TELEPHONE

TYPED OR PRINTED

206 272-0108

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments hereto)

AREA CODE NUMBER

MITTEE NAME/ADDRESS (include
City/Name/Location if different)

ME AK-WA, INC.

DRESS 601 ALEXANDER - BLDG. 9588

TACOMA, WA. 98421

QUALITY SAME

CATION

DISCHARGE MONITORING REPORT (DMR)
(17-19)

WA - 004014 - 2

PERMIT NUMBER

MONITORING PERIOD

FROM YEAR MONTH DAY TO YEAR MONTH DAY

HYDROBLASTING REPORT

2nd QTR

NOTE: Read instructions before completing this form.

PARAMETER (12-37)	QUANTITY OR LOADING (13-41)			QUALITY OR CONCENTRATION (14-61)			NO. EX (62-63)	FREQUENCY OF ANALYSIS (64-66)	SAMPLE TYPE (69-70)
	AVERAGE (66-68)	MAXIMUM (69-71)	UNITS (72-73)	AVERAGE (74-76)	MAXIMUM (77-79)	UNITS (80-81)			
OIL AND GREASE (MG/L)	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
TOTAL SUSPENDED SOLIDS (MG/L)	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
TR COPPER (UG/L)	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
TR ZINC (UG/L)	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
TR LEAD 9UG/L)	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
DISSOLVED COPPER (UG/L)	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								
	SAMPLE MEASUREMENT								
	PERMIT REQUIREMENT								

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE OF THE SIGNIFICANT PENALTY FOR FALSIFYING INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319 (Penalties under water pollution laws may include fines up to \$10,000 and/or maximum imprisonment of 6 months and 5 years.)

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER
OSCAR FRED OLSON
TYPED OR PRINTED

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT
[Signature]

TELEPHONE
206 272-0108

DATE
92 02 13

YEAR
92

MO
02

DAY
13

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

WATER NAME ADDRESS (Include
City Name/Location if different)

NAME AK-WA, INC.
ADDRESS 401 ALEXANDER - BLDG. 9588
TACOMA, WA - 98421

CITY SAME
CATION SAME

HAZ. DISCHARGE MONITORING REPORT (DMR)
(17-19)

WA - 004014 - 2
PERMIT NUMBER

DISCHARGE NUMBER

MONITORING PERIOD											
YEAR		MO		DAY		YEAR		MO		DAY	
93	01	01	01	01	01	93	01	01	01	01	01

HYDROBLASTING REPORT

302 Q28

NOTE: Read Instructions before completing this form

PARAMETER (12-17)	QUANTITY OR LOADING (14-16)			QUALITY OR CONCENTRATION (14-16)			UNITS	NO. EX (12-13)	FREQUENCY OF ANALYSIS (14-16)	SAMPLE TYPE (16-17)
	AVERAGE (14-15)	MAXIMUM (15-16)	MINIMUM (16-17)	AVERAGE (14-15)	MAXIMUM (15-16)	MINIMUM (16-17)				
OIL AND GREASE (NG/L)	SAMPLE MEASUREMENT				41.2				1/89	GRAB
	PERMIT REQUIREMENT				10					GRAB
TOTAL SUSPENDED SOLIDS (MG/L)	SAMPLE MEASUREMENT				239					COMP
	PERMIT REQUIREMENT				30					
TR COPPER (UG/L)	SAMPLE MEASUREMENT				6900					
	PERMIT REQUIREMENT				2.9 UG/L ² (25)					
TR ZINC (UG/L)	SAMPLE MEASUREMENT				3100					
	PERMIT REQUIREMENT				95 UG/L					
TR LEAD (UG/L)	SAMPLE MEASUREMENT				<100					
	PERMIT REQUIREMENT				<100					
DISSOLVED COPPER (UG/L)	SAMPLE MEASUREMENT				2370					
	PERMIT REQUIREMENT				140 UG/L					
	SAMPLE MEASUREMENT									
	PERMIT REQUIREMENT									
	SAMPLE MEASUREMENT									
	PERMIT REQUIREMENT									

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY KNOWLEDGE OF THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. 1001 AND 33 U.S.C. 1319. I understand under their signature, they are liable for up to \$10,000 and/or maximum imprisonment of between 6 months and 3 years.

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

206 272-0108 92 05 12

AREA CODE NUMBER YEAR MO DAY

TYPED OR PRINTED

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

3RD QUARTER PRODUCED 1 HYDROBLAST.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)
(17-19)

HYDROBLASTING REPORT

4th Ctr

NOTE: Read Instructions before completing this form.

WATER NAME ADDRESS (Include City Name/Location if different)
NAME AK-WA, INC.
ADDRESS 401 ALEXANDER - BLDG. 9588
TACOMA, WA - 98421
CITY SAME
STATE WA
CATION

WA - 004014 - 2
PERMIT NUMBER

MONITORING PERIOD
FROM 01/05/01 TO 07/31/01
YEAR MO DAY

PARAMETER (12.17)	QUANTITY OR LOADING (14.61)			QUALITY OR CONCENTRATION (14.61)			UNITS	NO. EX (12.61)	FREQUENCY OF ANALYSIS (14.61)	SAMPLE TYPE (16.70)
	AVERAGE (14.61)	MAXIMUM (14.61)	MINIMUM (14.61)	AVERAGE (14.61)	MAXIMUM (14.61)	MINIMUM (14.61)				
OIL AND GREASE (NG/L)										
	SAMPLE MEASUREMENT									
TOTAL SUSPENDED SOLIDS (NG/L)										
	PERMIT REQUIREMENT									
TR COPPER (UG/L)										
	PERMIT REQUIREMENT									
TR ZINC (UG/L)										
	PERMIT REQUIREMENT									
TR LEAD 9UG/L)										
	PERMIT REQUIREMENT									
DISSOLVED COPPER (UG/L)										
	PERMIT REQUIREMENT									

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER
OSCAR FRED OLSON
TYPED OR PRINTED

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY KNOWLEDGE OF THE INFORMATION, I BELIEVE THE INFORMATION IS TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 U.S.C. 1001 AND 33 U.S.C. 1319 (Pollution under these statutes, your sentence may be up to 100,000 and/or maximum imprisonment of between 6 months and 3 years.)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT
[Signature]


TELEPHONE
206 272-0108

DATE
92 08 03

AK-WA, INC.

MARCH, 1993
REVISED SEPTEMBER, 1993

APPENDIX 'B'
TEST RESULTS ON TREATED WASTEWATER



SPECTRA Laboratories, Inc.

2221 Ross Way • Tacoma, WA 98421 • (206) 272-4850

September 4, 1992

AK-WA
401 Alexander Bldg. 580
Tacoma, WA 98421

Attn: Rocky Becker

Sample ID: Treated Water
Project: NPDES
P.O. #7008-004
Sample Matrix: Water
Date Sampled: 8-25-92
Date Received: 8-31-92
Spectra #S208-162-1

pH	6.9
Oil and Grease, mg/L	0.6
Total Suspended Solids, mg/L	21
Total Cyanide, mg/L	<0.05

Total Recoverable Metals, ug/L

Arsenic (As)	<50
Cadmium (Cd)	<3
Chromium (Cr)	<7
Lead (Pb)	<40
Mercury (Hg)	<1 *
Silver (Ag)	<7
Copper (Cu)	8
Nickel (Ni)	<15
Zinc (Zn)	20

Total Dissolved Metals, ug/L

Copper (Cu)	8
-------------	---

* Mercury testing performed by EPA Method 7470

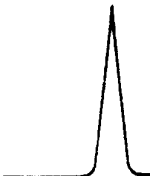
pH testing performed by EPA Method 9040
Fats, Oil and Grease testing by EPA Method 413.2 Partition Infrared.
Total Suspended Solids performed by Standard Method 2540-D
Total Recoverable Metals performed by EPA Method 200.2
Metals testing performed by EPA Method 6010

SPECTRA LABORATORIES, INC.


Steven G. Hibbs, Chemist

1 A

RECEIVED SEP 21 1992



SPECTRA Laboratories, Inc.

2221 Ross Way • Tacoma, WA 98421 • (206) 272-4850

September 18, 1992

AK-WA
401 Alexander Bldg. 580
Tacoma, WA 98421

Attn: Rocky Becker

Sample ID: Alaska Pakcer
P.O. #7008-004-2055P
Sample Matrix: Water
Date Sampled: 9-16-92
Date Received: 9-16-92
Spectra #S209-118-1
RUSH

pH	7.7
Oil and Grease, mg/L	0.9
Total Suspended Solids, mg/L	14
Total Cyanide, mg/L	<0.05

Total Recoverable Metals, ug/L

Arsenic (As)	<50
Cadmium (Cd)	<3
Chromium (Cr)	<7
Lead (Pb)	<40
Silver (Ag)	<7
Mercury (Hg)	<1 *
Copper (Cu)	68
Nickel (Ni)	<15
Zinc (Zn)	44


Total Dissolved Metals, ug/L

Copper (Cu)	19
-------------	----

* Mercury testing performed by EPA Method 7470

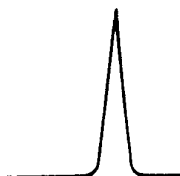
pH testing performed by EPA Method 9040
Fats, Oil and Grease testing by EPA Method 413.2 Partition Infrared.
Total Suspended Solids performed by Standard Method 2540-D
Total Recoverable Metals performed by EPA Method 200.2
Metals testing performed by EPA Method 6010

SPECTRA LABORATORIES, INC.



Steven G. Hibbs, Chemist

EXHIBIT 1



SPECTRA Laboratories, Inc.

2221 Ross Way • Tacoma, WA 98421 • (206) 272-4850

December 14, 1992

AK-WA
401 Alexander Bldg. 580
Tacoma, WA 98421

Attn: Rocky Becker

Sample ID: Excellance-Sea Fisher Comp.
Project: NPDES/City Sewer
P.O. #7008-004
Sample Matrix: Water
Date Sampled: 12-2-92
Date Received: 12-7-92
Spectra Project: S212-039
Spectra #1634

pH	6.9
Oil and Grease, mg/L	0.8
Total Suspended Solids, mg/L	8.0
Total Cyanide, mg/L	<0.05

Total Recoverable Metals, ug/L

Arsenic	(As)	<50
Cadmium	(Cd)	<3
Chromium	(Cr)	<7
Lead	(Pb)	<40
Mercury	(Hg)	<1 *
Silver	(Ag)	<7
Copper	(Cu)	32
Nickel	(Ni)	<15
Zinc	(Zn)	144

Total Dissolved Metals, ug/L

Copper	(Cu)	3
--------	------	---

* Mercury testing performed by EPA Method 7470

pH testing performed by EPA Method 9040

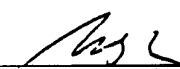
Fats, Oil and Grease testing by EPA Method 413.2 Partition Infrared.

Total Suspended Solids performed by Standard Method 2540-D

Total Recoverable Metals performed by EPA Method 200.2

Metals testing performed by EPA Method 6010

SPECTRA LABORATORIES, INC.


Steven G. Hibbs, Chemist

APPENDIX 'C'
PLANT OPERATING INSTRUCTIONS

NOTE: These instructions are also posted on the side of the treatment plant.

AK-WA, INCORPORATED

TREATMENT PROCEDURE FOR WASH WATER

1. Fill the upper tank of the system with 1000 gallons of the wash wastewater to be treated.
2. Turn on the process pumps and upper mixer.
3. Now the chemicals will be fed into the system. The chemical feed pumps should be set at the following air levels:

Polymer	20 psi
Hydrated Lime/Caustic	20 psi
Polyal-201	20 psi

4. First the Polyal-201 will be pumped in. The Polyal-201 timer should be set for 33 seconds. Turn the switch to automatic. The timer will be activated and the pump will run on and feed in Polyal-201 until the timer shuts the pumps off.
5. Next the Hydrated Lime/Caustic will be pumped in. Turn switch to manual. Pump in Hydrated Lime until the pH increases to 6.0 (high set points). We want to operate in the 8.5 - 9.0 pH range.
6. At this point the mixture should be allowed to circulate to make sure the pH stabilized. The pH should be between 6.5 and 7.5. If it is outside this range, Polyal-201 or Hydrated Lime should be added to bring the pH within this range.
7. A sample should now be taken (100 ml) and 10 drops of Polymer added. Mix the sample and observe if the break is clear. If break is not clear, turn the Polyal-201 pump on for another 10 seconds, adjust the pH with Hydrated lime and repeat test.

Remember: Polyal-201 lowers the pH and breaks water clear.

Hydrated Lime/Caustic raises the pH.

Polymer does not effect the pH and flow-lates solids.

8. The last step is to add in the Polymer. A timer in the panel can be set to pump in the Polymer (time how long it takes to add in the Polymer, then set the timer). It has been set for 90 seconds.

9. Wait 30 - 45 seconds after the Polymer has been added before shutting off the process pumps and upper mixture.
10. Observe the flotation in the viewing tubes. After all the solids have floated to the surface (wait 5 minutes) release water through the filter paper to the lower tank.
11. JAR TEST - 100 ML

3 drops each of Polyal-201 is equivalent to one gallon per 1000 processed.

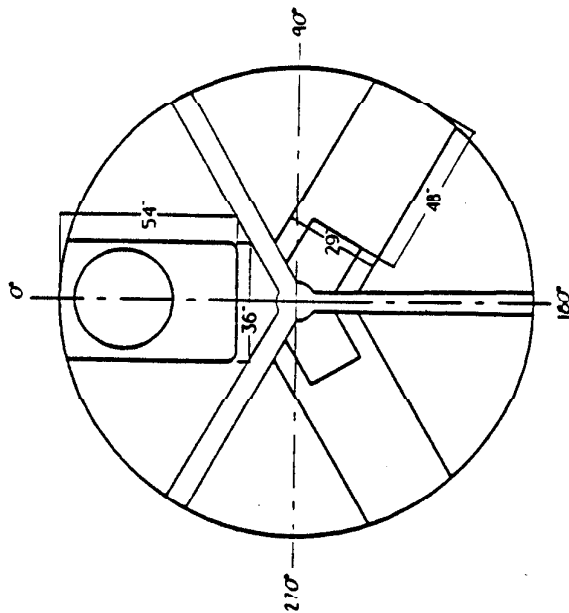
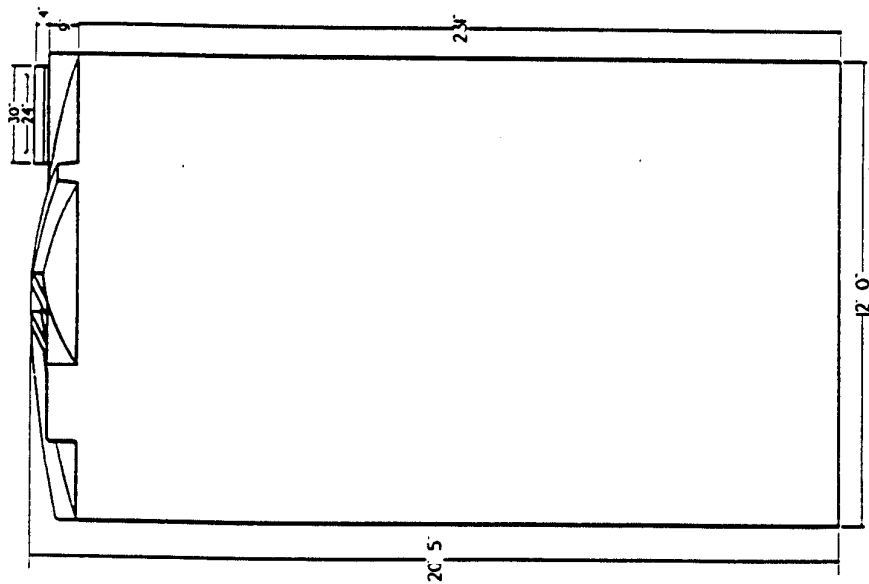
Every 3 drops is equal to two gallons per 1000 processed.

AK-WA, INC.

MARCH, 1993
REVISED SEPTEMBER, 1993

APPENDIX 'D'

CAL-CON 16,000 GALLON TREATED WATER HOLDING TANK



Be sure to supply all loads and conditions for the
the calculations include the weight of the tank
and any liquid inside and the weight of the
the tank is for the maximum weight
all other pressure of liquid and other loads for the

CAPACITY: 15,000 GALLONS	MODEL: PVC15K	△
DIAMETER: 12'-0" NORMAL	HEIGHT OVERALL: 20'-5"	△
WEIGHT: 4,500 LBS.	HEIGHT SSW: 12'-3"	△
REVISION: 3	MANWAY SIZE: 24" ENTRY	△
DATE: 8/7/92	MANWAY STYLE: STANDARD	△

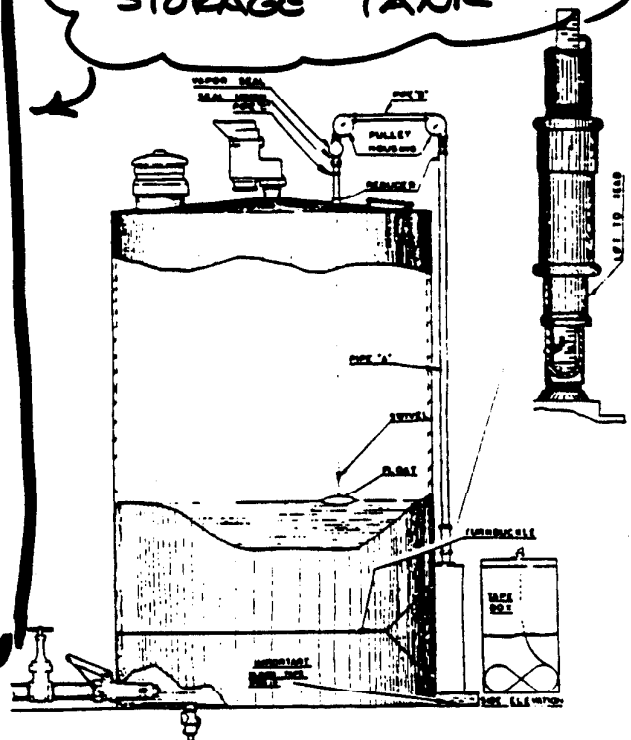
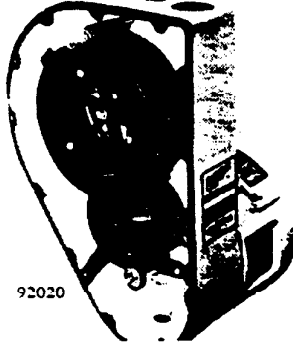
CEN-CAL TANKS
 CENTRAL CALIFORNIA CONTAINER MFG. INC.
 800 COMMERCE DR. CHICOHILLA, CA 93610
 CEN-CAL TANKS
 CENTRAL CALIFORNIA CONTAINER MFG. INC.
 800 COMMERCE DR. CHICOHILLA, CA 93610

AK-WA, INC.

MARCH, 1993
REVISED SEPTEMBER, 1993

APPENDIX 'E'

SHAND & JURS TANK GAUGE



Part Number	Tank Height	Weight
MR618-31CF	up to 31'	19 lbs.
MR618-40CF	up to 40'	26 lbs.
MR618-50CF	up to 50'	26 lbs.

**DMR SUMMARY AK-WA INC. PERMIT NO. WA-004014-2
STORMWATER**

OUTFALL NO. 002	Date	Oil & Grease mg/L			Total Suspended Solids mg/L			pH Standard Units			TR Copper ug/L			TR Zinc ug/L			TR Lead ug/L		
		Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max
	-4/93	1.6	3.0	4.4	0.9	5.5	10.0	6.5		6.6	133	142	150	175	1259	1742	<40	<40	<40
	-7/93	0.8	2.0	3.7	<1.0	7.0	13.0	6.7		8.2	101	195	287	132	750	1340		<40	
	01/5/93			12.4			16.5			6.8			196			1340			
OUTFALL NO. 003	Date	Oil & Grease mg/L			Total Suspended Solids mg/L			pH Standard Units			TR Copper ug/L			TR Zinc ug/L			TR Lead ug/L		
		Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max
	-4/93	0.3	7.7	15.0	2.0	140.0	278.0	6.1		6.5	125	683	3580	607	2094	3580	<40	69	97
	-7/93	0.2	0.5	0.9	<1	2.0	3.0	6.1		7.7	105	246	372	537	668	782		<40	
	01/5/93			2.8			12.5			6.8			97			797			
OUTFALL NO. 004	Date	Oil & Grease mg/L			Total Suspended Solids mg/L			pH Standard Units			TR Copper ug/L			TR Zinc ug/L			TR Lead ug/L		
		Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max
	-4/93	0.2	0.8	1.4	1.3	5.1	9.0	5.9		6.4	78	86	93	2280	2352	2423	<40	<40	<40
	-7/93	0.9	3.8	7.5	7.3	20.1	36.0	6.3		7.1	151	360	577	1960	2270	2520		<40	
	01/5/93			0.7			10.0			7.1			181			1580			

aded areas are permit violations.

DEPARTMENT OF ECOLOGY

December 22, 1993

TO: Sandra Stephens, SWRO
FROM: Brenden McFarland, Sediment Management Unit
SUBJECT: AK-WA Sediment Sampling and Analysis Plan

I want to document some of my understandings regarding the AK-WA Sediment Sampling and Analysis Plan (SAP), based on our December 22, 1993 telephone conversation. If you have any questions, please call me at 407-6913.

First, I understand that AK-WA will be redesigning stormwater treatment for the shipyard facility. When completed, the system will treat stormwater and discharge at a single point instead of the multiple discharges of the past. At some point in the future, an engineering report will be submitted which provides details of the redesigned stormwater system.

Second, you informed me that remediation will be taking place in Hylebos Waterway in the vicinity of the historic stormwater outfalls.

Based on the above, I recommend waiting before proceeding with any sediment sampling effort. From a source control perspective, sediment baseline monitoring serves two functions: (1) to provide a baseline of sediment quality against which to compare any future sediment impacts from a discharge, and (2) an indication of the potential for a discharge to impact sediment quality. The stormwater redesign and remediation activities described above do not allow us to proceed with a sediment sampling effort that serves these functions.

I recommend we postpone any sediment baseline monitoring until we receive updated information on stormwater treatment and remediation plans. At that time, I can provide a more detailed review of what would be required in a revised SAP. In the meantime, I will keep the current SAP in my files

TELEPHONE REPORT

Call To: Rocky Becker, Environmental Hazards Supervisor for AK-WA, Incorporated

From: Sandra Stephens, Compliance Inspector UBAT

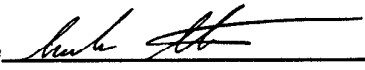
Date: 1/25/94

Time: 2:05 pm

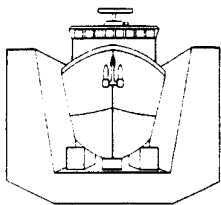
Subject: Reporting non-compliance of hydroblast wastewater condition of the NPDES permit, and a revised date for submitting the Engineering Report for collection and treatment of the stormwater from the paved areas in the yard.

Rocky reported that some hydroblast wastewater from the dry dock was allowed to discharge to the bay during an evening shift (Monday, 1/24/94). Rocky is still investigating the incident and will submit a written non-compliance notification report as required by G4 of the NPDES permit. The amount appears to be small and may be related to the reduction in forces AK-WA has had to implement (senior workers are having to do jobs they are not familiar with). Rocky will include what steps AK-WA is taking to ensure recurrence doesn't happen again.

Also, Rocky has meet with the comptroller regarding the billing status with ENSR. The comptroller for AK-WA indicated to Rocky that ENSR's remaining bill now totaled \$12,000.00. AK-WA has arranged to pay ENSR \$2,000/week, therefore, ENSR should be paid in full in the middle of March. However, AK-WA's slump is worse then originally projected (AK-WA has laid off workers & is currently down to 60 employees), and they have missed one weeks payment to ENSR. We agreed that the new target date for submittal of the report would be late March. Rocky will keep us posted.

Signature 

Date 1/31/94



AK - WA Inc.

401 Alexander Bldg. 9588 • Tacoma, WA 98421 • (206) 272-0108 • Fax (206) 272-4952
Mailing Address: P.O. Box 872, Tacoma, WA 98401-0872

January 27, 1994

SERIAL #05-195

94 FEB -1

SW REGIONAL

DEPT OF ECOLOGY
WATER QUALITY PROGRAM
MAIL STOP PV-11
OLYMPIA, WASHINGTON 98504-6811

ATTN: SANDRA STEPHENS

SUBJECT: NON-COMPLIANCE NOTIFICATION

DEAR SANDI:

THE INTENT OF THIS LETTER IS TO NOTIFY YOU OF A NON-COMPLIANCE OCCURRENCE ON 1-22-94 & 1-23-94, INVOLVING A HYDROBLASTING EVOLUTION ON THE FERRY VESSEL WALLA WALLA.

MY INVESTIGATION REVEALED UN-AUTHORIZED DISCHARGES OF HYDROBLASTING WATER CONTAINING EXCESSIVE LEVELS OF COPPER, ZINC & TOTAL SUSPENDED SOLIDS. THE ESTIMATED AMOUNT OF DISCHARGE IS 2,430 GALLONS.

THE DIRECT CAUSE OF THE DISCHARGE WAS DUE TO A DECISION BY THE WALLA WALLA PROJECT MANAGER TO CUT BACK THE PERSONNEL RUNNING THE COLLECTION SYSTEM FOR THIS JOB DUE TO A TIGHT BUDGET. THIS DECISION CAUSED INTERMITTENT LOSSES ON SATURDAY EVE (1-22-94), SUNDAY (1-23-94), AND NO WATER WAS COLLECTED SUNDAY EVE 1-23-94.

AK-WA RETURNED TO COMPLIANCE STATUS ON MONDAY 1-24-94 AT 0900 HOURS.

IN AN EFFORT TO PREVENT RECURRENCE, AK-WA HAS DISCUSSED THIS ISSUE IN GREAT DETAIL, AT THE HIGHEST LEVELS, EMPHASIZING THE IMPORTANCE OF THE PROJECT MANAGERS NOT TO INTERFERE WITH AK-WA'S ECOLOGY STAFF. WHEN THE PROJECT MANAGER HAS CONCERNS ABOUT

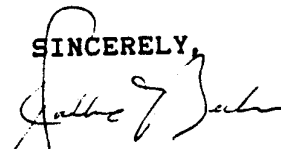
DRYDOCKING CONVERSIONS STEEL FABRICATION SHIP REPAIR

ECOLOGY STAFF/MANNING HE MUST CONTACT ROCKY BECKER OR DAN NICHOLS TO DETERMINE ADEQUATE MANNING FOR SUCH PROJECTS.

AK-WA HAS MADE IT CLEAR THAT THE PROJECT MANAGERS AUTHORITY DOES NOT EXTEND TO THE ECOLOGY STAFF. THIS WILL REDUCE THE POSSIBILITY OF RECURRENCE AND CLEARLY DIVIDES ECOLOGY STAFF FROM PRODUCTION STAFF.

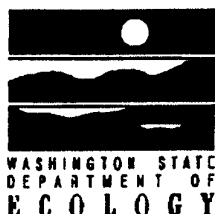
IF YOU SHOULD REQUIRE ANY FURTHER INFORMATION CONCERNING THIS MATTER PLEASE DON'T HESITATE TO CONTACT ME AT (206) 272-0108. THANK YOU.

SINCERELY,



ROCKY DECKER
ENVIRONMENTAL HAZARDS

RB/lr



INSPECTION REPORT

Date of Visit: January 28, 1994

Inspectors: Lee Bagley, Hazardous Waste & Toxics Reduction Program
Sandra Stephens, Toxics Cleanup Program

Name of Entity: AK-WA, Incorporated

Persons Contacted: Dean Johnson, Environmental Assistant

Permit Number: WA-004014-2

Permit Expires: August 1, 1996

City: Tacoma

County: Pierce

Type of Facility: Shipyard

Receiving Water: Hylebos Waterway

Type of Treatment System: Stormwater - Best Management Practices (BMPs)
Hydroblasting - Recycle System (Beckart Wastewater Treatment System)

COMMENTS

This was an unannounced NPDES Permit Class I Compliance Inspection conducted by Sandra Stephens from the Southwest Regional Office, Toxics Cleanup Program, Urban Bay Action Team (UBAT). Lee Bagley, from Ecology's Hazardous Waste and Toxics Reduction Program accompanied me on the inspection.

We arrived at the facility at approximately 10:35 a.m., on January 28, 1994, and left at 11:46 a.m. The weather was clear and sunny. Rocky Becker, AK-WA's Environmental Hazards Supervisor, was not in. After an approximate 8-10 minute wait, Dean Johnson, Environmental Assistant, for AK-WA, met us at the front gate and provided a tour and information.

The site is comprised of two 500-foot piers, one dry dock, and approximately 4 acres of adjoining yard. At the time of the inspection, there were two ferries (Aurora & Walla Walla), and a barge being worked on. At Pier No. 24 a Penwalt barge was being outfitted. The Alaskan Ferry, Aurora, berthed at Pier No. 24, was having an ADA elevator installed and life saving equipment replaced. The Washington Ferry, Walla Walla, was dry docked for exterior hull work.

OVERVIEW OF SITE OPERATIONS

Sandblasting Abrasive:

The small parts blasting shed is on the south side of the property. The heavy curtains which cover the open end of the building have not yet been replaced, therefore, there are holes in which fugitive blasting grit escapes to the outside. Holes observed in the walls of the blasting shed in our August 16, 1993, inspection report have been repaired. In addition, AK-WA has completed the following upgrades to the blasting shed area: pored a cement floor, added an internal wall to separate spent grit from the blasting area, and paved the area adjacent to the blasting shed and the bulkhead area where past spent grit was stored. Spent grit is currently stored under cover. Dean indicated that AK-WA is still looking for a bag house for the blasting shed.

In the past year AK-WA has purchased a new bobcat to run the yard sweeper. AK-WA sweeps the yard as needed. At the time of the inspection the yard was clean with the exception of in front of the blasting shed.

Hydroblasting:

The engineering report for hydroblasting Effluent Recycling System was approved by Ecology on December 2, 1993. Currently AK-WA recycles all wash water.

The Port of Tacoma is completing repairs to Pier No. 25, therefore, the location of the Beckart system was temporarily moved.

On January 25, 1994, AK-WA reported illegal discharges on January 22 and 23, 1994, of approximately 2,430 gallons of hydroblasting water. This water was not treated prior to its discharge. The violation was the result of a poor decision and human error. A project manager during night time operations on the weekend made the decision to delete one of two environmental personnel who run the hydroblasting effluent recycling system to reduce costs. He replaced the one environmental person with a non-experienced trades person. The trades person was responsible for ensuring that the sump boxes and pumps were working properly while conducting his other duties. Since he didn't have the experience or training, he did not watch the operation as closely as required which resulted in intermittent discharges to Hylebos Waterway. To prevent recurrence, AK-WA has implemented a policy that environmental staffing needs for a project will be determined by Rocky Becker or Dan Nichols, not the project manager. A copy of AK-WA's written report of the incident is attached.

Hazardous Waste:

The NPDES permit requires that the spill plan be updated and resubmitted on a biennially basis. The updated plan was due January 28, 1994. To date Ecology has not received the submittal.

Hazardous waste is now stored in the new hazardous waste storage area which is capable of collecting and holding spills and leaks. All containers were clearly marked, however, some of the containers were accumulated in September 1993. These containers were methyl ethyl ketone (MEK). AK-WA's pollution prevention plan states that AK-WA recycles MEK. The company (Sol-Pro of Tacoma) that recycles the MEK for AK-WA requires a minimum of 1,500 gallons. In order to collect 1,500 gallons AK-WA must store the MEK beyond the 90-day transport time. AK-WA appears to be in a Catch 22 between the Dangerous Waste Generator Laws and the Hazardous Waste Reduction Act.

For additional information see Lee Bagley's attached inspection report.

Metal Cleaning:

The hosing coming off the vents located on the cover of the tanks have been repaired.

Oil and Fuel:

Secondary containment and cover is now provided for the diesel storage area.

AK-WA's engineering department has determined that the existing containment is adequate for the acid tank.

Secondary containment has been provided for one of the bulk storage tanks. AK-WA is currently working on providing secondary containment for the remaining two bulk storage tanks.

Personnel:

AK-WA is experiencing a slump. AK-WA has reduced their work force from 220 to 60 production workers. To ensure that projects are adequately staffed with the properly trained environmental personnel, upper management has delegated the authority of staffing to Rocky Becker or Dan Nichols. Both Rocky and Dan work in the Environmental Program Department.

Stormwater:

Ecology has granted two extensions for submittal of AK-WA's engineering report for stormwater treatment. The first extension was due to AK-WA's consulting engineering firm -- ENSR's Chief Engineer had left the firm. The new engineer needed the additional time to become familiar with the project. The second extension was due to an economic slump AK-WA is currently experiencing. AK-WA has made arrangements with ENSR to pay \$2,000/week until their bill is paid. However, since these arrangements were made AK-WA has missed one payment. If AK-WA is successful in paying their bill, the report should be released to AK-WA in late March.

Ecology has no problem in extending the submittal date for the report as long as AK-WA installs the approved recommended alternative prior to remediation of Hylebos Waterway.

Sediment Monitoring Study:

Ecology has reviewed and commented on AK-WA sediment monitoring study plan on January 7, 1994. Since AK-WA is currently under a compliance schedule to provide stormwater treatment, it is in Ecology's and AK-WA best interest to delay any sediment sampling effort until the stormwater treatment system is in place and remediation of Hylebos waterway has occurred. However, if remediation of the Hylebos Waterway does not occur prior to the NPDES permit expiration date (August 1, 1996), then Ecology may require AK-WA to revise their Sediment Sampling Plan to reflect the upgraded stormwater facility.

BMPs:

AK-WA has not had the opportunity to update the site specific BMP plan to reflect all source control and treatment BMPs that they have installed this past year. As a result AK-WA appears to be implementing a more stringent BMP program than what is outlined in existing documents.

In addition, AK-WA's pollution prevention plan is now in place and being phased into their environmental program.

NPDES Submittals:

The following submittals were noted in Ecology's August 16, 1993, Class I Compliance Inspection Report as not received. Status of the report submittals are as follows:

Report Title	Date Received
S4. Solid Waste Control Plan	10/15/93
S.10.D. Stormwater Flow Calculation	10/14/93

Ecology reviewed and accepted the stormwater flow calculation on February 7, 1994. However, since AK-WA is pursuing corrective action in accordance with S10.H of the permit for stormwater discharges, the annual stormwater flow calculations are no longer required to be submitted. The method used only provided the volume of stormwater discharged for the year, not the flow rate. This information cannot be used to design a stormwater system.

Ecology has not yet reviewed the solid waste control plan.

The only outstanding submittal is the updated spill control plan which was due January 28, 1994.

Discharge Monitoring Report (DMR):

DMRs have been submitted to Ecology. A summary of DMR data is included in Attachment A of this inspection report.

The stormwater continues to exceed the effluent limitations for TR, copper, and zinc in all three stormwater outfalls.

The stormwater pH measurement reported in the 5-7/93 DMR for Outfall No. 002 was 8.2 standard units which is outside the acceptable range of 6-8 standard units as established in the permit condition S1.A. The pH measurement reported in the 2-4/93 DMR for Outfall No. 004 was 5.9 standard units which is also outside the acceptable range of 6-8 standard units.

The stormwater Total Suspended Solids (TSS) measurement reported in the 2-4/93 DMR for Outfall No. 003 was 140 and 278 mg/L respectively, which exceeds the effluent limit of 45 mg/L established in S1.A. of the permit.

The stormwater oil and grease measurement reported in 2-4/93 DMR for Outfall No. 003 was 15 mg/L, exceeding the effluent limitation of 10 mg/L. In addition, the stormwater oil and grease measurement reported in the 10/93 DMR was 12.4 mg/L, which also exceeded the effluent limitation of 10 mg/L.

AK-WA is pursuing corrective action in accordance with S10.H. of the permit which requires an engineering report for stormwater treatment.

RECOMMENDATIONS AND CONCLUSIONS

General housekeeping appeared to be adequate. The following conclusions summarize our findings and areas of noncompliance we observed and discussed. It also summarizes findings identified in AK-WA's noncompliance report which was received on February 1, 1994.

1. AK-WA needs to replace the heavy curtains which cover the open end of the shed. These curtains must cover the entire opening to prevent fugitive blasting grit from escaping.
2. To assure that all project managers are carrying out their responsibilities to implement environmental controls of the NPDES permit, AK-WA should require some kind of training confirmation report. This would assure that all managers were properly trained to prevent noncompliance with the NPDES permit and other environmental regulations.

Ecology will not take action at this time regarding the illegal discharge which occurred on January 22 and 23, 1994. Since the discharge was intermittent the total volume discharged is questionable. Also, it appears to be the result of poor judgement and human error. The corrective actions AK-WA has taken to delegate staffing authority to the Environmental Program Staff hopefully will prevent future noncompliance.

It is important for AK-WA to realize that they are not authorized to discharge hydroblast wastewater to Hylebos Waterway. The approved engineering report for hydroblast wastewater which is installed is a recycle system, therefore, any discharge is prohibited. Violations are subject to a daily \$10,000 fine and possible revocation of the NPDES permit. Therefore, it is important that operational and maintenance procedures outlined in your approved engineering report are followed at all times.

3. See attached inspection report for hazardous waste deficiencies.
4. Secondary containment shall be provided for the remaining two bulk storage tanks.
5. In late March, Ecology shall check the status of the engineering report for stormwater treatment.

Ecology will use the information in the engineering report and best professional judgement to determine the treatment options and implementation schedule that constitute "All Known Available and Reasonable Methods of Treatment" (AKART). With this new information, Ecology will propose to modify the permit based on the approved engineering report.

AK-WA must install the approved recommended alternative prior to remediation of Hylebos Waterway.

6. Sediment sampling is delayed until the stormwater treatment system is in place and remediation of Hylebos waterway has occurred.
7. The BMP plan should be updated to reflect actual operational BMPs for the site. The BMP plan should be in a binder and formatted to accommodate revisions. Any revisions to the BMP plan shall be submitted to Ecology as required by S9. of the NPDES permit.
8. Ecology must review and comment on the Solid Waste Control Plan.
9. The updated Spill Control Plan shall be submitted within 90 days of receipt of this inspection report.

**DMR SUMMARY AK-WA INC. PERMIT NO. WA-004014-2
STORMWATER**

OUTFALL NO. 002 Date	Oil & Grease mg/L			Total Suspended Solids mg/L			pH Standard Units			TR Copper ug/L			TR Zinc ug/L			TR Lead ug/L		
	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max
2-4/93	1.6	3.0	4.4	0.9	5.5	10.0	6.5		6.6	133	142	150	775	1259	1742	<40	<40	<40
5-7/93	0.8	2.0	3.7	<1.0	7.0	13.0	6.7		8.2	101	195	287	132	750	1340		<40	
10/15/93			12.4			16.5			6.8			196			1340			
OUTFALL NO. 003 Date	Oil & Grease mg/L			Total Suspended Solids mg/L			pH Standard Units			TR Copper ug/L			TR Zinc ug/L			TR Lead ug/L		
	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max
2-4/93	0.3	1.7	15.0	2.0	140.0	278.0	6.1		6.5	125	683	3580	607	2094	3580	<40	69	97
5-7/93	0.2	0.5	0.9	<1	2.0	3.0	6.1		7.7	105	246	372	537	668	782		<40	
10/15/93			2.8			12.5			6.8			97			797			
OUTFALL NO. 004 Date	Oil & Grease mg/L			Total Suspended Solids mg/L			pH Standard Units			TR Copper ug/L			TR Zinc ug/L			TR Lead ug/L		
	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max
2-4/93	0.2	0.8	1.4	1.3	5.1	9.0	5.9		6.4	78	86	93	2280	2352	2423	<40	<40	<40
5-7/93	0.9	1.8	7.5	7.3	20.1	36.0	6.3		7.1	151	360	577	1960	2270	2520		<40	
10/15/93			0.7			10.0			7.1			181			1580			

Shaded areas are permit violations.

Hazardous Waste Inspection Report

REC.# 11

DATE OF INSPECTION: January 28, 1994

ON

OFF

TIME: 10:00 AM 12:00 PM

☐ Announced☒ Unannounced

Facility Address / Contact

NAME: AK-WA Inc.

LOCATION ADDRESS: 401 Alexander Ave
Building 588

CITY: Tacoma

ZIP: 98421

FAC. LEAD: Mr. Rocky Becker

JOB TITLE: Environmental Manager

OTHER FAC.REPS.: Dean Johnson

PHONE: 272-1008

COUNTY: Pierce

Ecology / Information

REGION: SWRO

ADDRESS: 7272 Cleanwater Lane
PO Box 47775
Olympia, WA 98504-7775

LEAD INSP.: Lee Bagley

PHONE: 753-6375

OTHER GOVT
INSPECTORS /
OBSERVERS Sandy Stevens - UbatINSPECTION
TYPE

CEI

Facility Information

EPA/STATE ID #: WAD144405198

YEARS AT THIS LOCATION: 40

TYPE OF BUSINESS: Shipyard

PROCESS GENERATING Painting Operations

WASTE:

WASTE STREAMS & CODES: D001, F003

GENERATOR STATUS: NOTIFICATION/FILES

MQG

INSPECTION

LQG

SIC Code:

WASTE DISPOSAL / TREATMENT Recycle spent solvents on site and manifest still bottoms off-site to permitted TSD facilities.

PRACTICES:

ADDIT. FAC. INFO. / OTHER: Permitted under the NPDES system for storm water discharge

Pre-Inspection File Review Summary

PREVIOUS INSPECTIONS

Date
5-26-93Program
City of Tacoma

ENFORCEMENT HISTORY SUMMARY:

A NOV was issued by the City of Tacoma, Public Works Department for an unpermitted discharge of treated process water to sanitary sewer.

PREVIOUS DOCUMENTED VIOLATIONS:

The following violations were observed in a June 12, 1990 hazardous waste inspection.

1. WAC 173-303-200(c) and (d): unlabeled containers of hazardous waste
2. 40 CFR 268 Noncompliance with the Land Disposal Restrictions

Waste Management Requirements - Chapter 173-30. Sections Covered

- | | |
|--|--|
| <input checked="" type="checkbox"/> -070: Designation of Dangerous Waste | <input checked="" type="checkbox"/> -201: Special Accumulation Standards |
| <input checked="" type="checkbox"/> -141: Treatment, Storage and Disposal DW | <input checked="" type="checkbox"/> -340: Preparedness and Prevention |
| <input checked="" type="checkbox"/> -145: Spills and Discharges | <input checked="" type="checkbox"/> -630: Use and Management of Containers |
| <input checked="" type="checkbox"/> -200: Accumulation DW On-Site | |

WASTE MANAGEMENT VIOLATIONS OBSERVED	
NO.	
1	<p>WAC 173-303-200(1)(a) • Accumulated waste has remained on-site for more than 90 days.</p> <p>This violation pertains to 7 drums of hazardous waste, spent thinner, that had been accumulated on-site over 90 days. There were a total of 24 drums of hazardous waste in the facilities accumulation area. The over accumulated drums were dated as follows: Nov 11, 1993; Sept. 13, 1993; Aug. 16, 1993; Aug. 16, 1993; Oct. 18, 1993, Sept 13, 1993.</p>
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ADDITIONAL COMMENTS:

RECORD KEEPING REQUIREMENTS - CHAPTER 173-303 - SECTIONS COVERED

- | | |
|---|--|
| <input type="checkbox"/> -060: Notification (Form 2) | <input type="checkbox"/> -320: General Inspection |
| <input type="checkbox"/> -180: Manifest | <input checked="" type="checkbox"/> -330: Personnel Training |
| <input type="checkbox"/> -210: Generator Record Keeping | <input type="checkbox"/> -350: Contingency Plan and Emergency Pro. |
| <input type="checkbox"/> -220: Generator Reporting | |

NO

RECORD KEEPING VIOLATIONS OBSERVED

1	<i>WAC 173-303-630(6) • Failure to conduct weekly inspections using inspection logs, of dangerous waste accumulation areas and containers.</i>
2	
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COMMENTS:

**Required compliance actions
(the following ions must be completed by the e(s) indicated)**

NO.	REQUIRED ACTION(S) NOTE: Required Actions May Be Continued On Another Page	DATE
1	Within 14 days from your receipt of this letter, insure that all waste that has been accumulated on site for over 90 days, is shipped off-site via uniform hazardous waste manifest to a permitted TSD (treatment, storage, or disposal) facility.	3-1-94
2	Immediately upon receipt of this letter begin conducting weekly inspections utilizing inspection logs of hazardous waste accumulation area per WAC 173-303-630(6).	2-20-94
3		
4		
5		

Inspec.Photos Taken: ☒ YES

Samples taken (describe):

Exit Meeting Held: ☒ YES

Enf. Auth. Explained: ☐ NO

Materials Provided to Facility (list):

Sample Splits Offered: ☐ Provided: ☐ Refused: ☐

Photos Documenting Compliance Required: ☐

Attachments to Report:

1. Hazardous waste inventory
2. Hazardous waste inspection log

Lead Inspector's signature:

Joe D. Bayl

Date: Feb 3, 1994

Company/Site Name:

EPA/State Site ID#:

Date of Inspection:

AK-WA Inc.

WAD144405198

January 28, 1994



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

7272 Cleanwater Lane • PO Box 47775 • Olympia, Washington 98504-7775 • (206) 753-2353

February 15, 1994

Rocky Becker
AK-WA, Inc.
Building 588
401 Alexander
Tacoma, WA 98421-4200

Dear Mr. Becker:

Re: NPDES Permit No. WA-004014-2, Class I Compliance Inspection, AK-WA, Incorporated.

On January 28, 1994, I conducted the above-referenced inspection to determine compliance with NPDES permit requirements. A copy of my inspection report is enclosed for your information.

Ecology will not pursue an enforcement action at this time regarding the illegal discharge that occurred on January 22 and 23, 1994. However, it is important for AK-WA to realize that they are not authorized to discharge hydroblast wastewater to Hylebos Waterway. The approved engineering report treatment system for hydroblast wastewater is a recycle system, a no discharge system. Any discharge is considered a violation and subject to a daily \$10,000 fine and possible revocation of the NPDES permit. Therefore, it is important that operational and maintenance procedures outlined in your approved engineering report are followed at all times.

The nine conclusions noted in the inspection report summarize our findings. Not all conclusions require an action by AK-WA. If you have any questions, please call me at (206) 586-6240.

I would also like to thank Dean Johnson for his time that was spent in completing this inspection.

Sincerely,

A handwritten signature in cursive script, appearing to read "Sandra Stephens".

Sandra Stephens
Compliance Inspector
Toxics Cleanup Program
Southwest Regional Office

SS:dc

Enclosure

cc: Suzanne Dudziak, Port of Tacoma
Karen Keeley, EPA
Greg Cloud, Ecology
Cindy James, Ecology
Dave Smith, Ecology
Garin Schrieve, Ecology



United States Environmental Protection Agency
Washington, D.C. 20460

Form Approved
OMB No. 2040-0003
Approval Expires 7-31-85

NPDES Compliance Inspection Report

Section A: National Data System Coding

Transaction Code	NPDES	yr/mo/day	Inspection Type	Inspector	Facility Type
1 <u>N</u> 2 <u>E</u> 3 <u>W</u> <u>A</u> <u>O</u> <u>O</u> <u>4</u> <u>0</u> <u>1</u> <u>4</u> <u>2</u> 11		12 <u>9</u> <u>4</u> <u>0</u> <u>1</u> <u>2</u> <u>8</u> 17	18 <u>C</u>	19 <u>C</u>	20 <u>2</u>
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Section B: Facility Data

Name and Location of Facility Inspected AK-WA INC 401 ALEXANDER BLDG 588 TACOMA WA 98421-4200	Entry Time <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM 10:35	Permit Effective Date 08/01/91
	Exit Time/Date 11:46 01/28/94	Permit Expiration Date 08/01/96
Name(s) of On-Site Representative(s) DEAN JOHNSON	Title(s) ENVIRONMENTAL & SAFETY ASSISTANT	Phone No(s) (206) 272-0108
Name, Address of Responsible Official OSCAR FRED OLSON	Title PRESIDENT	
	Phone No. (206) 272-0108	Contacted <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Section C: Areas Evaluated During Inspection

(S = Satisfactory, M = Marginal, U = Unsatisfactory, N = Not Evaluated)

S	Permit	N	Flow Measurement	N	Pretreatment	S4	Operations & Maintenance
S1	Records/Reports	N	Laboratory	S3	Compliance Schedules	S	Sludge Disposal
S2	Facility Site Review	U3	Effluent/Receiving Waters	S	Self-Monitoring Program		Other:

Section D: Summary Of Findings/Comments (Attach additional sheets if necessary)

- The only outstanding submittal is the updated spill control plan which was due 01/28/94.
- General housekeeping was adequate. Over the past year AK-WA has corrected many deficiencies cited in Ecology's July 22, 1993 inspection. They have made considerable progress in complying with the Water Pollution Control Laws. Areas which require further work are (1) replace curtains on blasting shed; (2) provide environmental training and confirmation reports for all managers; (3) see Lee Bagley's report for hazardous waste deficiencies; (4) provide secondary containment for remaining two bulk storage tanks; and (5) BMP plan should be updated to reflect actual operational BMPs for the site.
- Ecology has granted an extension for submittal of AK-WA's engineering report for stormwater treatment. Currently AK-WA is experiencing an economic slump. AK-WA has made financial arrangements with their consulting engineer. AK-WA must install the approved stormwater treatment alternative prior to remediation of Hylebos Waterway.
- Overall, O&M is satisfactory; however, on January 22 and 23, 1994, there was an intermittent illegal discharge of hydroblast wastewater. It appears to be the result of poor judgement and human error. AK-WA has taken corrective actions that will prevent future noncompliance.

For additional information -- see report.

☐ Announced
☒ Unannounced

Name(s) and Signature(s) of Inspector(s) SANDRA STEPHENS	Agency/Office/Telephone ECOLOGY/SWRO/TCP/586-6240	Date <i>Sandra Stephens</i> 2/15/94
LEE BAGLEY	ECOLOGY/SWRO/HWTR/753-6375	<i>Lee A. Bagley</i>
Signature of Reviewer	Agency/Office	Date

Regulatory Office Use Only

Action Taken	Date	Compliance Status <input type="checkbox"/> Noncompliance <input type="checkbox"/> Compliance
--------------	------	--



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

7272 Cleanwater Lane • PO Box 47775 • Olympia, Washington 98504-7775 • (206) 753-2353

February 15, 1994

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Sandra Stephens
Compliance Inspector
Toxics Cleanup Program
Southwest Regional Office

SS:dc

Enclosure

cc: Suzanne Dudziak, Port of Tacoma
Karen Keeley, EPA
Greg Cloud, Ecology
Cindy James, Ecology
Dave Smith, Ecology
Garin Schrieve, Ecology



United States Environmental Protection Agency
Washington, D.C. 20460

Form Approved
OMB No. 2040-0003
Approval Expires 7-31-85

NPDES Compliance Inspection Report

Section A: National Data System Coding

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Remarks					
21 _____ 66					
Reserved Facility Evaluation Rating BI QA -----Reserved-----					
67 _____ 69	70 _____	71 _____ 72 _____	73 _____ 74 _____	75 _____	80 _____

Section B: Facility Data

Name and Location of Facility Inspected AK-WA INC 401 ALEXANDER BLDG 599 TACOMA WA 98421-4200	Entry Time <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM 10:35	Permit Effective Date 08/01/91
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Name(s) of On-Site Representative(s) DEAN JOHNSON	Title(s) ENVIRONMENTAL & SAFETY ASSIST	Phone No(s) (206) 272-0108
Name, Address of Responsible Official OSCAR FRED OLSON	Title PRESIDENT	
	Phone No. (206) 272-0108	Contacted <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Section C: Areas Evaluated During Inspection

(S = Satisfactory, M = Marginal, U = Unsatisfactory, N = Not Evaluated)

S	Permit	N	Flow Measurement	N	Pretreatment	S4	Operations & Maintenance
S1	Records/Reports	N	Laboratory	S3	Compliance Schedules	S	Sludge Disposal
S2	Facility Site Review	U3	Effluent/Receiving Waters	S	Self-Monitoring Program		Other:

Section D: Summary Of Findings/Comments (Attach additional sheets if necessary)

- The only outstanding submittal is the updated spill control plan which was due 01/28/94.
- General housekeeping was adequate. Over the past year AK-WA has corrected many deficiencies cited in Ecology's July 22, 1993 inspection. They have made considerable progress in complying with the Water Pollution Control Laws. Areas which require further work are (1) replace curtains on blasting shed; (2) provide environmental training and confirmation reports for all managers; (3) see Lee Bagley's report for hazardous waste deficiencies; (4) provide secondary containment for remaining two bulk storage tanks; and (5) BMP plan should be updated to reflect actual operational BMPs for the site.
- Ecology has granted an extension for submittal of AK-WA's engineering report for stormwater treatment. Currently AK-WA is experiencing an economic slump. AK-WA has made financial arrangements with their consulting engineer. AK-WA must install the approved stormwater treatment alternative prior to remediation of Hylebos Waterway.
- Overall, O&M is satisfactory; however, on January 22 and 23, 1994, there was an intermittent illegal discharge of hydroblast wastewater. It appears to be the result of poor judgement and human error. AK-WA has taken corrective actions that will prevent future noncompliance.

For additional information -- see report.

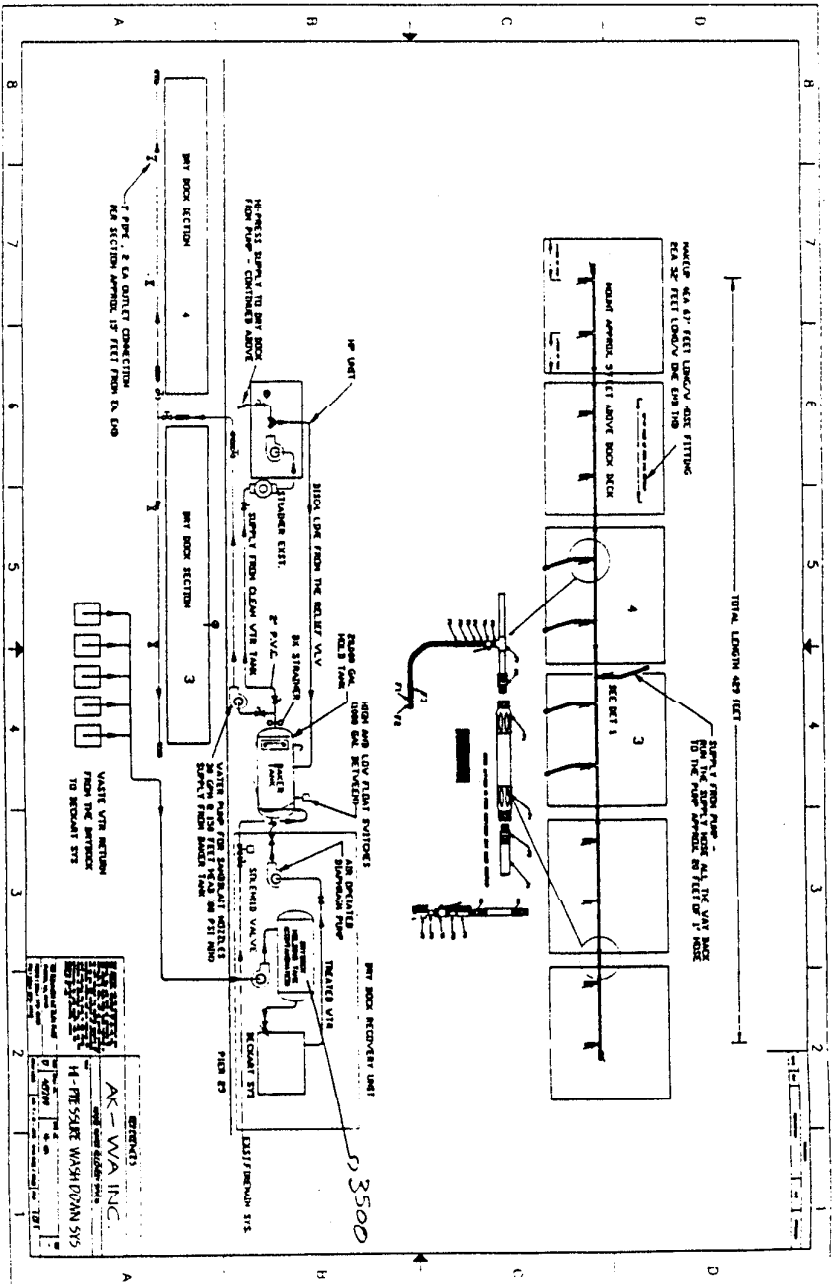
☐ Announced
☒ Unannounced

Name(s) and Signature(s) of Inspector(s) SANDRA STEPHENS	Agency/Office/Telephone ECOLOGY/SWRO/TCP/586-6240	Date <i>Sandra Stephens</i> 2/15/94
LEE BAGLEY	ECOLOGY/SWRO/HWTR/753-6375	<i>Lee Bagley</i>
Signature of Reviewer	Agency/Office	Date

Regulatory Office Use Only

Action Taken	Date	Compliance Status <input type="checkbox"/> Noncompliance <input type="checkbox"/> Compliance
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APPENDIX A



Richard A. Smith
Attorney

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Seattle WA 98103

Tel. & Fax (206)783-1483

BY CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Managing Agents
Ak-Wa, Inc.
401 Alexander Ave., Bldg. #9588
Tacoma WA 98421

May 6, 1994

Re: NOTICE OF INTENT TO FILE SUIT UNDER THE CLEAN WATER ACT

Gentlemen:

I represent the Pacific Environmental Enforcement Council ("PEEC"). For the purposes of this matter, I am associated with M. David Kamas, Siegel, Bellovin and Kamas 2430 East Sixth Street, Tuscon, Arizona 85719. Any response or correspondence related to this matter should be directed to me. This letter is to provide you with sixty days' notice of our client's intent to file a citizen suit against Ak-Wa pursuant to Section 505 of the Clean Water Act ("CWA"), 33 USC § 1365. Ak-Wa has violated and continues to violate the CWA (see Section 301 of the CWA, 33 USC § 1311), its National Pollutant Discharge Elimination System ("NPDES") permit issued and effective on June 28, 1991 (Washington Department of Ecology issue number WA-004014-2, the "permit") and Washington state water pollution control laws as follows:

I. Stormwater Effluent Limitations, Monitoring and Reporting

Condition S1.A. of the permit sets effluent limits for stormwater discharges from outfalls numbers 002, 003, and 004. Condition S2.A. sets out requirements for sample frequency and type for stormwater discharge parameters. Condition S3. requires that monitoring results obtained during the previous three months in accordance with condition S2 be summarized and reported on Discharge Monitoring Report ("DMR") forms and submitted to the Department of Ecology no later than the fifteenth day of the month following the completed reporting period. The relevant requirements of condition S1.A. and S2.A. are summarized in the following table:

<u>Parameter</u>	<u>Monthly Average Effluent Limitation</u>	<u>Sample Point</u>	<u>Sampling Frequency</u>
Oil and Grease	10 milligrams per liter ("mg/L")	002,003,004	Monthly
Total	45 mg/L	002,003,004	Monthly
Suspended Solids ("TSS")			
pH	6 - 8 Standard Units ("s u")	002,003,004	Monthly
Total	2.9 micrograms per liter ("ug/L") (25)	002,003,004	Monthly
Recoverable ("TR") Copper			
TR Lead	140 ug/L	002,003,004	Monthly
TR Mercury	2.1 ug/L	002,003,004	Monthly
TR Nickel	75 ug/L	002,003,004	Monthly
TR Zinc	95 ug/L	002,003,004	Monthly

11.	12/92	003	1031
12.	12/92	004	3231
13.	11/92	002	2210
14.	11/92	003	1480
15.	11/92	004	3520
16.	8/92 - 10/92	002	1990
17.	8/92 - 10/92	003	2831
18.	8/92 - 10/92	004	6110
19.	5/92 - 7/92	002	4160
20.	5/92 - 7/92	003	870
21.	5/92 - 7/92	004	1930
22.	2/92 - 4/92	"A"	4610
23.	2/92 - 4/92	"B"	6620
24.	2/92 - 4/92	"C"	7466.66
25.	11/91 - 1/92	002	3890
26.	11/91 - 1/92	003	4956.66
27.	11/91 - 1/92	004	3706.6
28.	9/91 - 10/91	002	380
29.	9/91 - 10/91	003	380
30.	9/91 - 10/91	004	380

C. Information currently available to PEEC indicates that Ak-Wa has violated condition S1.A. with regard to the limitation for monthly average TSS (set at 45 mg/L) as follows:

	<u>Period of Violation</u>	<u>Outfall Number</u>	<u>Reported Value</u>
1.	2/93 - 4/93	003	140 mg/L
2.	12/92	003	67
3.	12/92	002	71
4.	11/92	002	53
5.	11/92	004	290
6.	8/92 - 10/92	002	48.5
7.	8/92 - 10/92	003	97.33
8.	2/92 - 4/92	"A"	60.33
9.	2/92 - 4/92	"B"	117.33
10.	2/92 - 4/92	"C"	123.33
11.	11/91 - 1/92	002	56.53
12.	11/91 - 1/92	003	314.66
13.	11/91 - 1/92	004	66.6

D. Information currently available to PEEC indicates that Ak-Wa has violated conditions S1.A. with regard to the limitation for monthly average Oil and Grease (set at 10 mg/L) as follows:

	<u>Period of Violation</u>	<u>Outfall Number</u>	<u>Reported Value</u>
1.	2/92 - 4/92	"A"	10.13
2.	2/92 - 4/92	"C"	22.63
3.	11/91 - 1/92	002	23.26
4.	11/91 - 1/92	003	18.53
5.	9/91 - 10/91	003	15.7

E. Information currently available to PEEC indicates that Ak-Wa has violated conditions S1.A., S2.A. and/or S3. with regard to the limitation for monthly average TR Lead (set at 140 ug/L) as follows:

	<u>Period of Violation</u>	<u>Outfall Number</u>	<u>Reported Value</u>
1.	8/93 - 10/93	All	Not Reported
2.	5/93 - 7/93	All	Not Reported
3.	11/91 - 1/92	003	373.33 ug/L
4.	9/91 - 10/91	002	4240
5.	9/91 - 10/91	003	4240
6.	9/91 - 10/91	004	4240

F. Information currently available to PEEC indicates that Ak-Wa has violated conditions S1.A., S2.A. and/or S3. with regard to the limitation for monthly average TR Nickel (set at 75 ug/L) as follows:

	<u>Period of Violation</u>	<u>Outfall Number</u>	<u>Reported Value</u>
1.	8/93 - 10/93	All	Not Reported
2.	5/93 - 7/93	All	Not Reported
3.	2/92 - 4/92	"B"	"<100" ug/L
4.	11/91 - 1/92	002	"<100"
5.	11/91 - 1/92	004	"<100"
6.	9/91 - 10/91	All	Not Reported

G. Information currently available to PEEC indicates that Ak-Wa has violated conditions S2.A. and/or S3. with regard to the limitation for monthly average TR Mercury (set at 2.1 ug/L) as follows:

	<u>Period of Violation</u>	<u>Outfall Number</u>	<u>Reported Value</u>
1.	8/93 - 10/93	All	Not Reported
2.	5/93 - 7/93	All	Not Reported
3.	9/91 - 10/91	All	Not Reported

H. Information currently available to PEEC indicates that Ak-Wa has violated conditions S1.A. with regard to the limitation for pH (set at an allowable range of between 6 and 8 s.u.) as follows:

	<u>Period of Violation</u>	<u>Outfall Number</u>	<u>Reported Value</u>
1.	5/93 - 7/93	002	8.2 s.u.
2.	2/93 - 4/93	004	5.9

I. Permit condition S2.A. requires monthly sampling at outfalls 002, 003, and 004 for Oil and Grease, TSS, pH, TR Copper, TR Lead, TR Zinc, TR Nickel, and TR Mercury. Information currently available to PEEC indicates that Ak-Wa has violated this condition at each outfall as follows:

<u>Period</u>	<u>Sample Frequency (# of times for parameter/days)</u>							
	<u>Oil and Grease</u>	<u>TSS</u>	<u>pH</u>	<u>TR</u> <u>Copper</u>	<u>TR</u> <u>Lead</u>	<u>TR</u> <u>Zinc</u>	<u>TR</u> <u>Nickel</u>	<u>TR</u> <u>Mercury</u>
8/93 - 10/93	1/92	1/92	1/92	1/92	0	1/92	0	0
2/93 - 4/93	2/89	2/89	2/89	2/89	2/89	2/89	2/89	2/89
5/92 - 7/92	1/92	1/92	1/92	1/92	1/92	1/92	1/92	1/92
9/91 - 10/91	1/92	1/92	1/92	1/92	1/92	1/92	1/92	1/92

II. **Hydroblasting Effluent Limitations, Monitoring and Reporting**

Condition S1.C. of the permit sets effluent limits for hydroblasting waste water discharges from outfalls numbers 001. Condition S2.B. sets out requirements for sample frequency and type for stormwater discharge parameters. Condition S3. requires that monitoring results obtained during the previous three months in accordance with condition S2 be summarized and reported on Discharge Monitoring Report ("DMR") forms and submitted to the Department of Ecology no later than the fifteenth day of the month following the completed reporting period. The relevant requirements of condition S1.C. and S2.B. are summarized in the following table:

<u>Parameter</u>	<u>Daily Maximum</u> <u>Effluent Limitation</u>	<u>Monthly Average</u> <u>Effluent Limitation</u>	<u>Sampling Frequency</u>
Oil and Grease	15 mg/L	10 mg/L	Weekly
TSS	45 mg/L	30 mg/L	Weekly
TR Copper	2.9 ug/L (25)		Weekly
TR Zinc	95 ug/L		Weekly
TR Lead	140 ug/L		Weekly

A. Information currently available to PEEC indicates that Ak-Wa has violated conditions S1.C., S2.C. and S3. of its permit by failing to sample or report hydroblasting waste water discharge parameters as required since July 1992.

B. Information currently available to PEEC indicates that Ak-Wa has violated condition S1.C. with regard to the limitation for daily maximum TSS (set at 15 mg/L) as follows:

	<u>Period of Violation</u>	<u>Reported Value</u>
1.	5/92 - 7/92	258 mg/L
2.	2/92 - 4/92	239
3.	11/91 - 1/92	579
4.	8/91 - 10/91	306

C. Information currently available to PEEC indicates that Ak-Wa has violated condition S1.C. with regard to the limitation for monthly average TSS (set at 10 mg/L) as follows:

	<u>Period of Violation</u>	<u>Reported Value</u>
1.	5/92 - 7/92	135 mg/L
2.	2/92 - 4/92	239
3.	11/91 - 1/92	250.82
4.	8/91 - 10/91	113.96

D. Information currently available to PEEC indicates that Ak-Wa has violated condition S1.C. with regard to the limitation for daily maximum TR Copper (set at 2.9 ug/L(25)) as follows:

	<u>Period of Violation</u>	<u>Reported Value</u>
1.	5/92 - 7/92	4130 ug/L
2.	2/92 - 4/92	6900
3.	11/91 - 1/92	16400
4.	8/91 - 10/91	41000

E. Information currently available to PEEC indicates that Ak-Wa has violated condition S1.C. with regard to the limitation for daily maximum TR Zinc (set at 95 ug/L) as follows:

	<u>Period of Violation</u>	<u>Reported Value</u>
1.	5/92 - 7/92	790 ug/L
2.	2/92 - 4/92	3100
3.	11/91 - 1/92	4150
4.	8/91 - 10/91	5500

F. Information currently available to PEEC indicates that Ak-Wa has violated condition S1.C. with regard to the limitation for daily maximum TR Lead (set at 140 ug/L) as follows:

	<u>Period of Violation</u>	<u>Reported Value</u>
1.	11/91 - 1/92	210 ug/L
2.	8/91 - 10/91	290

G. Information currently available to PEEC indicates that Ak-Wa has violated condition S1.C. with regard to the limitation for daily maximum Oil and Grease (set at 15 mg/L) as follows:

	<u>Period of Violation</u>	<u>Reported Value</u>
1.	2/92 - 4/92	41.2 mg/L

H. Information currently available to PEEC indicates that Ak-Wa has violated condition S1.C. with regard to the limitation for monthly average Oil and Grease (set at 10 mg/L) as follows:

	<u>Period of Violation</u>	<u>Reported Value</u>
1.	2/92 - 4/92	41.2 mg/L

III. Reporting

Permit condition S3.A. requires that, "[m]onitoring results obtained during the previous three (3) months shall be summarized and reported on the Discharge Monitoring Report (DMR) Form (EPA 3320-1) and submitted no later than the 15th day of the month following the completed reporting period." Information currently available to PEEC indicates that Ak-Wa has violated this condition by failing to submit the required DMRs on time or at all for the following periods: